REPORT RESUMES

ED 020 065 RC 002 517

PROMISING PRACTICES FOR SMALL SCHOOLS IMPROVEMENT. ANNUAL PROGRESS REPORT.

BY- STUTZ, ROWAN C.

WESTERN STATES SMALL SCHOOLS PROJECT

PUB DATE SEP 65

EDRS PRICE MF-$0.50 HC-$4.48 110P.

DESCRIPTORS- ELEMENTARY SCHOOLS, ENGLISH, *INDIVIDUALIZED PROGRAMS, INDIVIDUALIZED INSTRUCTION, LANGUAGE ARTS, MATHEMATICS CURRICULUM, NONGRADED CLASSES, *RURAL SCHOOLS, *SCHOOL IMPROVEMENT, SCHOOL PERSONNEL, SCHOOL SERVICES, SECONDARY SCHOOLS, *SMALL SCHOOLS,

MEETING THE UNIQUE PROBLEMS OF PROVIDING QUALITY EDUCATION IN SMALL SCHOOLS CALLS FOR SPECIAL PROGRAMS. THE WESTERN STATES SMALL SCHOOLS PROJECT HAS COMPILED 9 PROMISING PROGRAM PRACTICES WHICH CAPITALIZE UPON THE POTENTIAL STRENGTHS INHERENT IN SMALLNESS--INDIVIDUALIZED INSTRUCTION IN HIGH SCHOOL LANGUAGE ARTS, INDIVIDUALIZED ENGLISH IN A SMALL HIGH SCHOOL, INDIVIDUALIZED INSTRUCTION IN A SMALL ELEMENTARY SCHOOL, INDIVIDUALIZED AND NON-GRADE MATH IN A SMALL HIGH SCHOOL, MODERN MATHEMATICS IN AN INDIVIDUALIZED PROGRAM, AND EXPANDING MATHEMATICS STUDY OPPORTUNITIES IN SMALL HIGH SCHOOLS. EACH PRACTICE IS DESCRIBED BY THE PARTICIPATING SCHOOL, WITH AN ACCOUNT OF THE DESIRED OUTCOMES, PREPARATION, PRACTICE, AND EVALUATION. (SF)

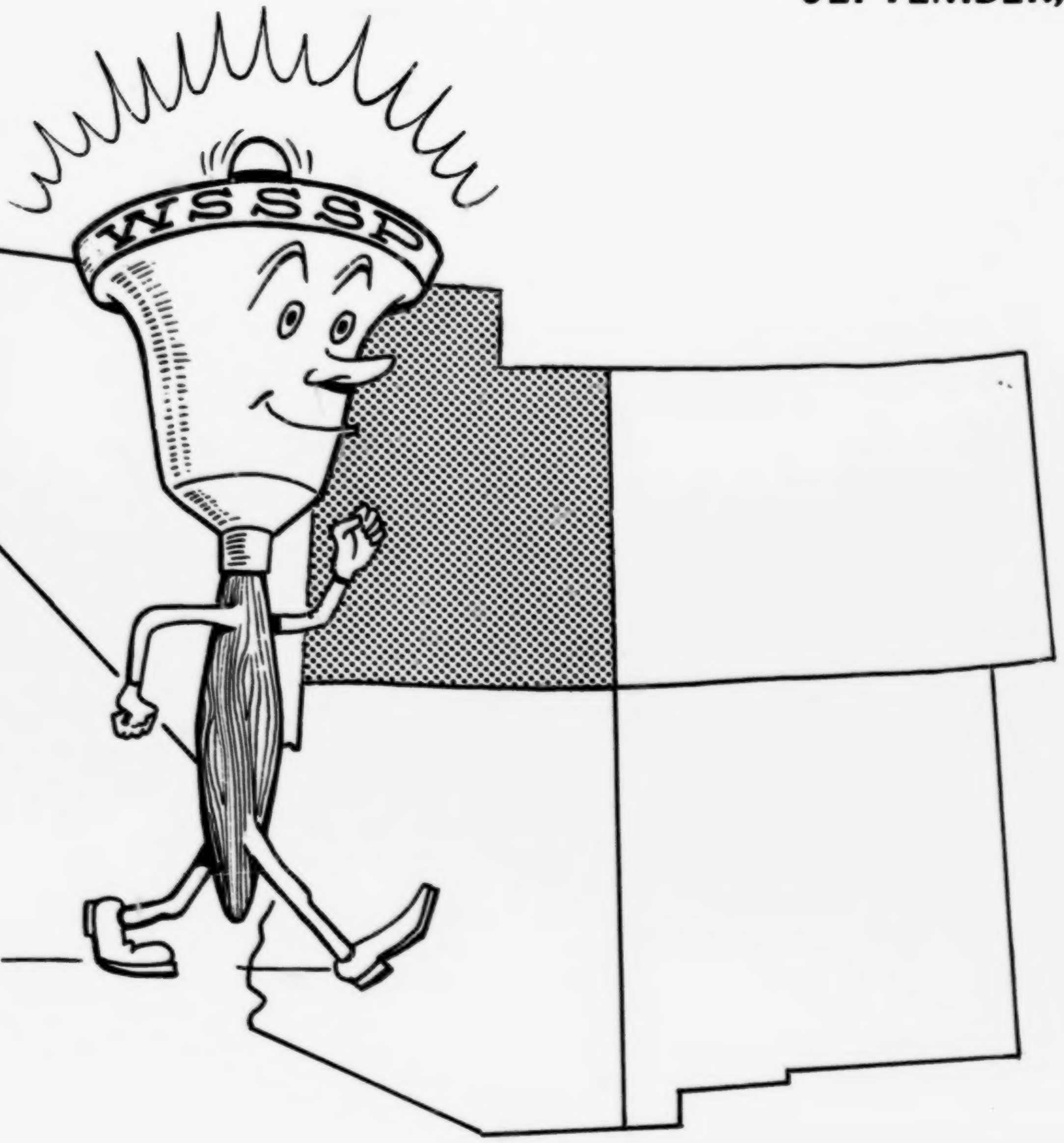
RECEIVED
JUN 24 1968
NMSU
E.R.I.C.

ED020065

Western
States
Small
Schools
Project

PROMISING PRACTICES FOR SMALL SCHOOLS IMPROVEMENT

ANNUAL PROGRESS REPORT
SEPTEMBER, 1965



EC 002517

UTAH STATE DEPARTMENT OF PUBLIC INSTRUCTION

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

WESTERN STATES SMALL SCHOOLS PROJECT
IN UTAH

PROMISING PRACTICES FOR SMALL SCHOOLS IMPROVEMENT

ANNUAL PROGRESS REPORT
September 1965

Compiled by
Rowan C. Stutz

STATE OF UTAH
DEPARTMENT OF PUBLIC INSTRUCTION
STATE CAPITOL BUILDING
T. H. Bell, Superintendent
Salt Lake City, Utah

TABLE OF CONTENTS

Page

INTRODUCTION 1

PROMISING PRACTICE

#1 Individualizing Instruction in High School Language Arts 3
Panguitch High School

#2 Individualized Instruction in Language Arts 9
Beaver High School

#3 Individualizing Instruction in a Small Elementary School - Part I 17
Bicknell Elementary School

#3 Individualizing Instruction in a Small Elementary School - Part II 43
Bicknell Elementary School

#4 Individualizing English in a Small High School 59
Bryce Valley High School

#5 Individualizing and Non-Grading Math in a Small High School 65
Bryce Valley High School

#6 Modern Mathematics in an Individualized Program 69
Escalante Elementary School

#7 Individualizing Instruction in High School Language Arts 73
Milford High School

#8 Individualizing Instruction in High School English 81
Wayne High School

#9 Expanding Mathematics Study Opportunities in Small High Schools 87
Wayne High School

INTRODUCTION TO ANNUAL PROGRESS REPORT 1965

Introduction

Most small schools are located in remote and sparsely settled rural areas. The factors of smallness, remoteness, and sparsity combine to create many problems in providing quality instructional programs in small schools. Among these problems are

- --narrow curriculum
- --limited resources
- --poor physical facilities
- --inadequate instructional materials and equipment
- --a short supply of good teachers

The Western States Small Schools Project, with the help of a Ford Foundation grant, has attempted to provide the stimulus for the development of programs which get at solutions to these problems and, also, which capitalize upon the potential strengths inherent in smallness.

Such practices as

- --mobile services
- --personalized curriculum
- --independent study opportunities
- --individual and small group instruction
- --team teaching
- --learning laboratories
- --imaginative use of educational technology
- --continuous progress organization
- --self-instructional materials
- --better student progress record keeping procedures

have been blended into an instructional design in small schools which expands the curriculum, increases teacher utilization and satisfaction, makes available resources not otherwise available, and individualizes instruction.

In no project school do any of these practices exist alone. A sincere effort has been made to develop a total instructional design. Three years of project activity has hardly provided sufficient time to touch all areas of the curriculum or to involve all members of a faculty. However, as a single practice showed promise every effort was made to integrate it with the total school program and to diffuse it throughout the school and throughout the system.

This publication contains the reports of these promising practices as developed and evaluated by those who developed them. It is hoped that these reports of practices will serve to stimulate others to become interested in small school improvement and through the adoption of some of these practices or through the development of some of their own new and promising ideas will experience the thrill of seeing small schools become good schools.

Additional information about the Western States Small Schools Project or any of these practices may be obtained by writing to Western States Small Schools Project in Utah, Room 223 State Capitol Building, Salt Lake City, Utah.

PROMISING PRACTICES FOR IMPROVING INSTRUCTION IN SMALL SCHOOLS

Practice No. 1

Individualizing Instruction in High School Language Arts

Panguitch High School
Panguitch, Utah

A project of
The Western States Small School Project

Utah State Department of Public Instruction
Dr. T. H. Bell, Superintendent
Room 223, State Capitol Building
Salt Lake City, Utah

INDIVIDUALIZING INSTRUCTION IN HIGH SCHOOL LANGUAGE ARTS

Garfield County District
Russell G. Merrell,
Superintendent

Panguitch High School
Clifford S. LeFevre,
Principal

Contributing Teacher(s)

Donna Peterson
Gloria Houston
Clifford S. LeFevre

* * * * * *

General Description -

(a) Problem to be Solved:

The basic problem was that of inadequate English instruction for pupils in a small high school resulting from mass teaching techniques, moving all students through the same material at the same pace, inadequate teaching materials, and sub-standard professional preparation by some of the teachers of English. In addition, there was inefficient use of teacher time due to the teacher handling many clerical and housekeeping duties and due to the sometimes excessively small class load.

(b) Desired Outcomes:

It was hoped that through a program of individualized instruction, team teaching, improved record keeping and the use of lay readers and clerical help, English instruction at Panguitch High School could be improved. The strengths of the small school, especially low teacher-pupil ratio and teacher knowledge and understanding of each child, were to be accentuated and by use of the team approach; inadequate teacher preparation and inefficient use of teaching time were to be minimized. The object was to provide each child, 10 through 12, with an English program that would more nearly fit his unique needs.

(c) Grades, Pupils and Teachers Involved:

The English program at PHS in 1964-67 included 135 pupils grades 10 through 12. Three teachers, one secretary, and several lay readers comprised the instructional team. This team, except for the lay readers, was involved for one hour daily.

(d) Our School:

Panguitch High School serves the rural communities of Panguitch and Hatch, Utah. The principal industry is agriculture with emphasis on livestock raising with a growing tourist industry in second place. Pupils at Panguitch High School are from low and medium income families with a relatively small number from professional families. The school population is stable, uniformly white, L.D.S.

Preparation - In preparation for this experiment, Mrs. Gloria Houston and Mrs. Donna Peterson, spent a week at the Brigham Young University, where Dr. John Crnkovic and June Whitford of the Brigham Young University Experimental High School served as special consultants. They were given a week of intensive training, in which all of the aspects of continuous progress programs were discussed. By the end of the week, they were sufficiently convinced of its merits to try this approach in their school, in the coming year.

Mrs. Houston and Mr. Clifford S. LeFevre, principal, spent a week at the Utah State University in August where they were given additional help and ideas. The latter part of August, the three of them spent another week in their own school, under the direction of Dr. Crnkovic, making up their program for the year, writing and planning units.

In addition all professional members of the team have attended the WSSSP for Utah Summer Workshop at the Brigham Young University in the summer of 1964. Members of the team have visited other project schools. Mrs. Peterson attended the National Convention of the NCTE.

Practice - Each of the members of the team was to assume certain responsiblities during the year. This is outlined as follows:

Mr. LeFevre, principal of the high school, acted as monitor and consultant to ninety students who met for independent studying in the old gymnasium.

Mrs. Houston was assigned the responsibility of programming and developing literature units. She also was in charge of the remedial and developmental reading programs.

Mrs. Peterson was responsible for the composition (writing) and grammar part of the instructional program, including the spelling and "How To Study" skills.

A lay reader was employed. Her responsibilities were to read all of the compositions written by students (one for each unit in literature and one for each unit in composition). In reading the student's written work in connection with the literature or creative writing units, she was asked to comment on each idea or use of words especially those that were good or exceptional, and to not be too critical of mechanics of writing. The students compositions (formal) were checked in more detail for grammar, spelling and punctuation. These were returned to the students for corrections and returned to the reader.

Mrs. Alice Henrie was the secretary assigned to the team two periods a day. She probably had one of the most important assignments. Mrs. Henrie administered, checked, and recorded all tests. She recorded every time a student came into a lecture or discussion group and everytime he handed in a written assignment. She did most of the typing and was an invaluable source of help to the team in relieving teachers of most of their clerical chores.

The program was a continuation of the program described in our 1963-64 report. Refinement of record keeping practices and modifications in the English units of work to more nearly fit individual needs, were affected.

Physical facilities from the preceding year were changed. The base of operations from the program was moved from the two conventional classrooms into the abandoned school gymnasium. With this as a base, use was made of all parts of the high school building during the English period. This was possible since all pupils were enrolled in English during this period. The large area for the home base for pupils made for an improved program. So much so, in fact, that a remodeling program in the summer of 1965 will make permanent the arrangements.

Evaluation - The Board of Education expressed its belief in the program by providing for a remodeling program at Panguitch High School costing about $60,000,00, which will make more adequate facilities for individualized instruction.

Students are generally favorable toward the program. As measured by the standardized achievement tests, student achievement was as good or better than achievement of preceding classes in the traditional program.

Parent response is mixed. Most responses are supportive of the general program. Most adverse criticism deals only with fragments of the program.

Teacher support is enthusiastic. Those in the program are extending practices of the program into their other classes and state without reservation that they would not go back to the old program.

It has been noted by teachers, both in and out of the project, that pupils are tending to assume more responsibility for learning and are becoming more self directional in their study.

The Panguitch High School next year, with its newly completed "Learning Barn", will begin exploring the place of environment in individual study. A serious attempt will be made to assess the place of a variety of environmental factors in relation to individualized study.

PROMISING PRACTICES FOR IMPROVING INSTRUCTION IN SMALL SCHOOLS

Practice No. 2
Individualized Instruction in Language Arts

Beaver High School
Beaver, Utah

A project of
The Western States Small School Project

Utah State Department of Public Instruction
Dr. T. H. Bell, Superintendent
Room 223 - State Capitol Building
Salt Lake City, Utah

INDIVIDUALIZED INSTRUCTION IN LANGUAGE ARTS

Beaver County District	Paul Lefevor, Superintendent
Beaver High School	M. W. Heslington, Principal

Contributing Teacher(s):

Margery M. Twitchell

* * * * * *

General Description - The practice of individualizing instruction in the Language Arts Department of Beaver High School was undertaken to upgrade the basic skills of communication. It was believed that such a program would give the students a chance to achieve and progress in an atmosphere conducive to the development of their abilities and the satisfaction of their needs. The program is geared to the individual student so that his means of communication might be broadened and his interests aroused to do a better job of learning for himself, rather than for the teacher and the grade.

In the past school year, 331 students were involved. This is the total enrollment of grades seven through twelve entered in Beaver High School.

Four class periods were used for the language arts. The students were divided by registration into four sections. Two sections involved the 7th, 8th, and 9th grade students, and two sections involved the 10th, 11th, and 12th grade students.

Four teachers, the principal, and a lay member were involved in the instruction and testing. Each teacher worked in the program for three periods and taught other classes during the remainder of the day. The lay member administered part of the tests, corrected most tests, and filed the tests in a file reserved for that purpose. The principal assisted in monitoring the large groups, and sometimes assisted individual students.

Preparation - All teachers involved in the program attended summer school in 1964. Three of the teachers were studying in the language arts area.

A three-week workshop for teachers and supervisors in the Beaver School District was held for preparation purposes.

Three teachers and the District Supervisor attended a one-week Western States Small School Project workshop for teachers and supervisors at Brigham Young University, Provo, Utah.

A survey was made of all facilities available.

All books and materials available were examined and counted.

Pretesting was used as a beginning basis for establishing the abilities and needs of each individual student.

Evaluation of students' abilities was made by the members of the teaching team.

Study guides were prepared.

A personal interview with each student to establish an expectancy level of performance was held at the beginning of the year. A personal file was prepared for each student, in which he would enter his scores and achievements during the year.

A two-week unit on "How to Study" was undertaken by all students at the beginning of the year.

A wall was removed from between two classrooms, thus making a large study room.

Additional audio-visual equipment and textbooks were purchased.

Public meetings were held to acquaint the community with the project.

Practice - At the first of the year each period group was divided into four sections of approximately twenty-one students each. One section was in a classroom for language instruction. One section was in a classroom for literature instruction. The other two sections were in the large classroom for independent study in other areas. These sections were on a rotating basis throughout the week.

After three months of this program, it was discarded because it caused too much confusion in the minds of the pupils. Another reason was that it did not allow for follow-up activities.

The remainder of the year was divided into units of work. Students registered for each three-week unit. Counseling teachers helped them work out balanced programs. Upon request, students were taken into clarification groups or discussion groups. Individual help was available at all times in the large study room.

Each teacher was given about one-fourth of the students of each period to counsel.

The team teachers were allowed daily planning periods, but, because of complications with the other scheduled classes, all teachers were not able to attend the planning periods at the same time.

Spelling exercises were recorded on tape and were made available to the students for study and testing.

Overhead transparancies were used to teach composition in the upper division. Programmed material was used in the lower division.

At the end of the first semester a "satisfactory" or "unsatisfactory" report was sent home. One grade was given at the end of the year. A student was always aware of his progress because he kept a graph of all test scores and assignment grades. He measured these scores with his own expectancy level which was marked on the graph in red. The expectancy level was established at the personal interview at the first of the year.

When a student showed evidence that he had completed a unit of study, he was given a permit to take a test. The permits were handed to the lay member of the staff who then administered the test and corrected it immediately or as soon as possible.

Outside reading was recorded on a "thermometer" type graph in the student's file. Book reports were handed in on each selection read.

Evaluation - The team teachers believe that a great many changes, most of them for the better, have taken place in the practice this year. At first, the students were confused by the rotating sections. Later, when the sections were dissolved, and the three-week unit plan was begun, more students settled down to work. Many students have requested the unit plan with voluntary sign-up for the units for next year.

One of the great problems this year was finding rooms in which to meet. One of the classes was much too large for the study room. The overflow went into the library or into the one other classroom available. This made a problem in finding room for discussion groups. The large study room was too crowded during two of the classes to promote efficient study.

The experience of team teaching has been valuable to the instructors. It was surprising how many differences arose in methods of teaching. These differences were resolved by discussion. All teachers agreed that much had been learned from each other.

One 9th grade boy made the remark, "I've learned more in grammar this year than in all my other years of school put together."

Another student said, "I've learned my lesson. Next year I'm going to study harder at the first of the year. I've had to work like a dog this last month to get enough units completed."

One student who regularly receives high marks said, "I like this way of studying. You can work at what you want instead of having the teacher tell you all the time."

Some shy students did not move voluntarily toward achievement. One such boy said, "I don't think I learned a thing." However, on being questioned, he said, "I've read nearly all the literature books on the shelf."

One parent who had objected to the change in program early in the year, said, "My children really hated the program at first, but they seem to like it much better now."

The junior high students reacted to the change in program more easily than the upper division students. However, they had more difficulty in getting around to keeping their personal records up-to-date.

Literature lost much when the discussions became fewer. It is hoped that by adopting a more thematic approach next year, more discussions can be held by the students. The students need more experience in how to voluntarily participate in small group work.

Another improvement will be the scheduling of a definite period for teacher planning when all team members can be present.

The testing room was too small for efficient testing, and other arrangements must be planned sometime soon.

Materials and Resources -

1 Classroom, double-sized
1 Classroom, regular size
Library
Auditorium
Lunch room, small
Testing room (enclosed hall)
2 Overhead projectors
2 Movie projectors
1 Film strip projector
3 Screens
2 Tape recorders
1 Record player
2 Television sets
1 Opaque projector
Study guides
Records, tapes
Chalk boards
Bulletin boards
Desks, tables
Supplies
Resource people
Movies
Filmstrips
Miscellaneous anthologies and other literature books
Paperback books

Science Research Associates, Inc. publications:

How to Study
Words, A Programmed Course in Vocabulary Development
Spelling Laboratory IIIa
Contemporary Composition (Series of overhead transparancies)
Reading Laboratories IIIa, IVa, RFU, Elementary

Harcourt, Brace & World publications:

3200, 2600, 2200 Programmed Courses in Grammar and Usage

English Grammar & Composition by Warriner (7-12)
Adventures for Readers, Laureate Ed., Books I, II.
Steps to Better Reading, Books I, II, to accompany above.
Adventures in Literature - Companion Series (7-12)

Scott, Foresman publications:

America Reads Series (7-12)

Row, Peterson publications:

The New Building Better English (7-12)

California Test Bureau publications:

Series C-D Grammar
Series E-F Grammar

Houghton Mifflin Company publications:

Building Spelling Power (7-10)

Ginn publications:

Programmed Course in Writing I (A, B, C)
Programmed Course in Writing II (A, B, C)

Zaner-Bloser publications:

Guiding Growth in Handwriting (7-8)

PROMISING PRACTICES FOR IMPROVING INSTRUCTION IN SMALL SCHOOLS

Practice 3
Individualizing Instruction in a Small Elementary School
Part I

Bicknell Elementary School
Bicknell, Utah

A Project of
The Western States Small School Project

Utah State Department of Public Instruction
Dr. T. H. Bell, Superintendent
Room 223 - State Capitol Building
Salt Lake City, Utah

PART I
INDIVIDUALIZING INSTRUCTION IN A SMALL ELEMENTARY SCHOOL

Wayne County District	Arthur H. Lee, Superintendent
Bicknell Elementary School	John A. Brinkerhoff, Principal

Contributing Teacher(s)

Venettia Allen
Golda Jackson

* * * * * *

General Description - In the school year 1961-62, because of the decrease in enrollment in the Bicknell Elementary School, it became necessary to combine grades.

The faculty and administrators were concerned about the most effective ways of teaching students under these conditions. A series of meetings were held with parents, teachers, administrators and consultants. Studies were made of schools that were using an ungraded program. Visits were made to schools where this type of program was being conducted. It was decided to organize two Primary Units in our school, consisting of children of first, second and third grades, in each unit.

It was decided to use heterogeneous grouping. To accomplish this purpose the following pre-tests were administered to the students. The Metropolitan Readiness Test to first year, the California Achievement Battery Test to second and third year students. These students were ranked from highest to lowest, and every other student was placed in one Primary Unit, the remaining students in the other unit.

This pattern of grouping was used for three years in the school until the year 1964-65 when the change in student population made it necessary to change the grouping. During this year the Primary Unit consisted of eleven first year children, nine second year children and no third year children.

__Desired Outcomes__ - The purpose of the individualized program in the elementary school is to provide a program designed for the individual differences and the abilities of all the children.

We know that children differ widely in their ability to learn. We also know that no two children develop abilities at the same time or the same rate. The individualized program makes it possible for teachers to guide each child in his prograss at a time and rate best suited to him.

Our basic philosophy is that we accept each child where he is and move him along as fast as his capacity to learn will permit. Some of the ways the teacher might help to more effectively meet the individual needs of the children are: by-

1. Helping students to adjust socially.
2. Helping students to become more secure by staying with the same teacher for more than one year.
3. Encouraging students to become more independent.
4. Inspiring students to be more creative and willing to try new methods of attacking their problems.
5. Teaching the basic skills (as soon as the child is ready for a particular skill.)
6. Encouraging children to keep a record of the progress they have made.
7. Helping children to develop a desire to continually strive for improvement in their work.
8. Providing opportunities to challenge the abilities and interests of all the children.

__Preparation__ - It is the opinion of the teachers who have worked in an individualized program that special classes and in-service training should be required of all teachers before they are expected to teach in this type of program.

During the first year of the program in our school, materials for individualized instruction were limited and we had very little consultant help. We attempted to adapt our text books for individualized instruction. It was necessary for the teachers to plan and prepare many units of work. It was important for them to create and develop many new materials that could be used. This required a great deal of time and still didn't produce the results that had been anticipated.

By the close of the school year we felt that we had made some progress, however, we felt the need for additional materials and help in using them.

The year 1962-63 we were accepted as a participating school in the Western States Small School Project. The teachers spent two days observing individualized instruction as it was being practiced in the Brigham Young University Laboratory School. Dr. John Crnkovic of the Laboratory School became our consultant. During the summer a series of meetings were held with him. He brought the B.Y.U. spelling program to our school and familiarized the teachers with its use. He also instructed us in the use of the S.R.A. Reading Program. Later in the year we received the Greater Cleveland Mathematics Program.

All these new materials proved to be of great value. They saved much time for the teacher, helped the students to work more independently, promoted greater student interest and seemed to promote greater student progress than materials used in previous years.

In 1963-64 Mrs. June Searle, of the Brigham Young University Laboratory School, was our consultant. Mrs. Searle is well trained in this type of program. She made several visits to our school and gave us special help in reading, spelling and mathematics.

In June of this year 1965, under the leadership of Dr. Delva Daines, a special class or workshop was held in Bicknell for the teachers of Wayne County District. Dr. Daines gave us much information and help in grouping, individualized instruction and team teaching.

Each year the Western States Small Schools Project, under the direction of Rowan C. Stutz, has sponsored a workshop and all personnel connected with the project have been privileged to attend. Top resource men and women have come from all parts of the United States to these workshops to instruct and inspire teachers in the educational programs. From these lectures, demonstrations, discussions and displays, the teachers have received a great deal of valuable information and material that is being used in the classroom. To all of these educators we are most appreciative.

In addition, the teachers have made many things of their own that have been used successfully in an individualized program. Some of these are charts, posters, puppets, movies, displays for the library, labels for the science corner, files, folders and packets for each child. A system of record keeping to be used by both the teacher and the child.

Practice: - The non-graded program is a means of making functional a philosophy that has been talked about for many years. It is most effective as a method of adjusting teaching procedures to meet the individual differences among children.

There is no magical formula for teaching in the ungraded school. Each teacher must develop her own method with her class and work out her own techniques as she experiments. Some of the methods that have been tried in our classes have not worked so well, while others have worked very well and brought desired results.

Reading: - The reading program in the Bicknell Elementary Primary Unit includes basic reading, library reading, S.R.A. reading and self-selection reading.

The basic reading class was usually the first period of the day. During this period all the children in the room were engaged in reading. Each child had a basal reader on a grade level best suited to his ability. The children met in small groups for word study and help in the basic skills. The teacher worked with each group and as the children finished they could begin on the special activity assignments that had been given at the beginning of the reading period.

The library reading consisted mostly of a choice of books from the bookmobile or the library in the school. Most of this reading was done at home. When the child had finished reading the book, he brought a note signed by the parents. A record was kept of all the library books read by the children.

This last year we organized a Book Club. Everyone in the room belonged to the club. The officers of the club were the president and the secretary. Every two weeks the children voted for new officers. It was the duty of these officers to make the library attractive and keep the books in good order. It was also their duty to check the books out for the children and to see that all the books were returned on time.

On Friday afternoons we had sharing time. Each child would share something from the books he had read during the week. He would tell an exciting part of a story or make a picture, etc. Occasionally a child would write a paragraph or two about a certain book, then he would stop in the middle of the exciting part and say to the children, "If you want to hear the rest of the story, you can read it." "I'll help you find the book in our library."

This was also the time the children recorded in their personal library record, the names of the books they had read during the week. (A sample of this record is included in this report). This program not only saved much time for the teacher but it also helped the children to develop leadership ability, dependability and other qualities.

The S.R.A. reading program was taught later in the year, after the first year children had learned enough reading skills so that they were capable of using this material along with the older students.

Each story in the lab was of great interest to the children. They seemed fascinated by the stories and enjoyed doing the exercises. Most of the children made great progress in this program.

Self-selective reading program; An individualized reading period in our room runs something like this.

1. A short planning session by the whole class to set the goals for the period.

2. Individual silent reading.
   With the older children this period usually lasts thirty minutes or sometimes even longer. With first year children a shorter period. Often an older, more capable child is assigned to help other children with difficult words, or two children may help each other.

   During this time the teacher is busy helping a small group with certain basic skills or she may be busy with pupil-teacher conference.

3. Related activities.
   The child then records in his note book the progress he has made during the reading period. This includes the date, the name of the book, the number of pages read, and difficult words that he needs help with. Then he proceeds to work on other related activities to which he has been assigned. He may be expected to do some writing, or prepare for a movie or puppet show, or make a picture, etc.

4. Sharing.
   This sharing is sometimes done in small groups or may be with the entire class.

5. Evaluation.
   The evaluation is done by the class. It is usually a check to see if the goals set at the beginning of the reading period have been accomplished.

In our reading program this year we have done more sharing than in previous years. I have found that sharing has several important objectives. One objective is that of acquainting children with a wide variety of books. Another is that of fostering personality growth through the development of the child's powers of expression.

Many good language arts lessons have come from the sharing activity in our self-selective reading classes. (For example)

1. A movie script adapted from a good action story.
2. A series of original illustrations for a story.
3. An evaluation of a book, with reasons for liking it.
4. An oral or written description of an interesting character in a book.
5. A description of the most humorous incident, the most exciting happening or the part liked best.
6. A pantomine or dramatization.

Record keeping is an important part of the individualized program . I suppose there is no set plan or form to follow. I have kept a reading record book (loose leaf) in which I have written the child's name, his age, his approximate reading level and other information.

Beginning with the first student-teacher conference I have recorded the date, the name of the book the child has chosen to read, the grade level of the book, the number of pages the child has read thus far, and as the child reads I write brief notes on any difficulties that I have observed, such as finger pointing, repeating words, skipping lines, etc. I observe to see if he needs help in certain word attack skills. I make a note of any assignment I have given to the child. The next day or at the next conference, I quickly check to see if progress has been made on the problems previously assigned.

The Children's Record:

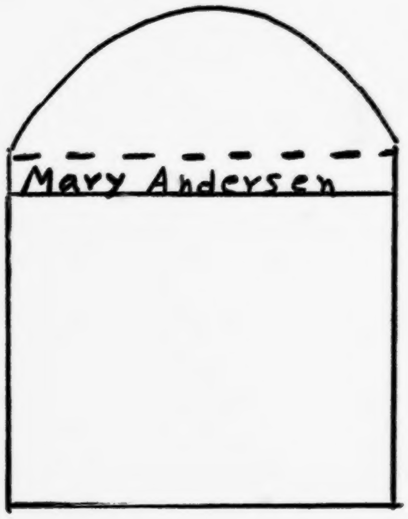
Each child has his own reading notebook. In this notebook he writes the title, the author and the date he started reading the book. Each day he records the number of pages he has read. He lists difficult words that he needs help with and the date that he finishes the book. The children seem to ready enjoy keeping their own records.

Library Reading

Here are some samples of the records kept by the children.

No.	Date	Name of Book	Pages	Star
1	Jan.	Green Hills	132	

Each child had his own record book. The book contained sheets like the sample above.


Mary Andersen

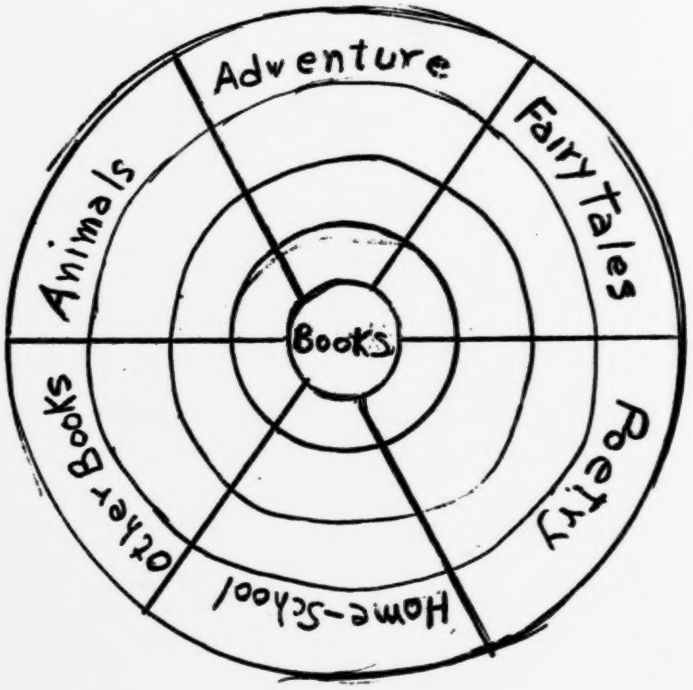
Each child had a card pocket in OUR BIG BOOK on which he kept a record of the library books he had read.

Individualized Reading

Page from child's notebook

Name of Book	Date
	Pages read
	Date
	Pages read
Name of Book	Date
	Pages read
	Date
	Pages read

The child kept a record each day of the material that he had read.


Adventure
Fairy Tales
Poetry
Home-School
Other Books
Animals
Books

Each child pasted one of these wheels on the inside cover of his reading notebook. When he finished reading his book he colored one space under the heading to which this book belonged.

GRADE PLACEMENT

California Achievement Test

READING VOCABULARY

	Test	Test	Actual Grade Placement	Above Grade Placement
	1964	1965	1965	1965
Colleen	2.9	5.0	2.9	+2.1
Bob	2.4	4.2	2.9	+1.3
Joe	2.2	3.8	2.9	+ .9
Marlin	---	3.6	2.9	+ .7
William	1.8	3.6	2.9	+ .7
Joyce	2.0	3.2	2.9	+ .3
Carolyn	1.6	3.3	2.9	+ .4
Deniece	1.8	3.5	2.9	+ .6
Monty	1.1	1.5	2.9	-1.4
Tonya		3.3	1.9	+1.4
Carla		2.5	1.9	+ .6
Dave		2.4	1.9	+ .5
Mel		2.9	1.9	+1.0
Peter		1.9	1.9	+ .0
Paula		2.1	1.9	+ .2
Mike		2.1	1.9	+ .2
Pat		2.3	1.9	+ .4
Tom		2.1	1.9	+ .2
Don		1.7	1.9	- .2
Marge		1.6	1.9	- .3

The average number of years above grade placement for the children are:

For first year students	1965	+0.3		
For second year students	1964	+0.1	1965	+0.6

Note: The results of this test shows that the first year children this year scored .2 of a grade higher than the first year children did last year.

Note: The wide range of reading ability, from first to fifth grade.

GRADE PLACEMENT

California Achievement Test

READING COMPREHENSION

	Test 1964	Test 1965	Actual Grade Placement 1965	Above Grade Placement 1965
Colleen	2.1	4.2	2.9	+1.3
Bob	2.3	4.3	2.9	+1.4
Joe	2.3	4.3	2.9	+1.4
Marlin	---	3.9	2.9	+1.0
William	1.7	3.9	2.9	+1.0
Joyce	1.8	2.9	2.9	+ .0
Carolyn	1.7	3.5	2.9	+ .6
Deniece	1.4	3.0	2.9	+ .1
Monty	1.2	1.6	2.9	-1.3
Tonya		2.8	1.9	+ .9
Carla		1.9	1.9	+ .0
Dave		2.1	1.9	+ .2
Mel		1.9	1.9	+ .0
Peter		1.8	1.9	- .1
Paula		1.8	1.9	- .1
Mike		1.8	1.9	- .1
Pat		1.9	1.9	+ .0
Tom		1.8	1.9	- .1
Don		.0	1.9	-1.9
Marge		1.7	1.9	- .2

The average number of years above grade placement for the children are:

For first year students	1965	- .1		
For second year students	1964	- .1	1965	+ .6

-Spelling:- The spelling program used in our school was developed by the Brigham Young University Laboratory School and was followed according to the instructions.

This spelling program is written on levels, beginning with level I A, level I B, level II A, etc. Within each level there are several spelling lessons or groups of words. Each group contains words with the same phonetic sounds. The rules for studying the spelling words helped the child to work independently. These rules were attached to each spelling book.

At the beginning of each year a placement test was given. The results of which indicated the level or book the child should begin to study. Each child worked with a partner, one who was studying words from the same level, however, if a child progressed faster than this partner he moved to another partner.

When a level or book had been completed, a unit test was given. This test consisted of a written review of all the words or every other word in the spelling level that the child had just finished studying. When the child passed this test he was ready to begin working on the next level.

Functional words taken from the children's experiences or needs were added to the spelling lists. An accurate record was kept on each child's progress. Nearly every day the teacher marked in her record book to show the exact group of words on which the child was studying. Two or three times each week she tested the children on all the words they had studied since she met with them the time before. This testing was done with children in small groups or individually.

An accurate record was kept of all the unit tests; the date they were given, and the number of words missed by each child. Children's study notebooks were checked often and help was given in writing, capitalization and punctuation where needed.

The following Table is a modified example of the record kept by the teacher. First, with reference to the spelling levels as worked out by the

B. Y. U.,level I A is ordinarily introduced at the beginning of the second grade, therefore, a child who has completed level I A and level I B is actually spelling third grade words. Level II A and II B refers to fourth grade words.

Note: from the placement test given at the beginning of the year, that three second year children started studying words on level I B while the rest of the children needed to begin on level I A. It was interesting to note that the one child (Carolyn) even though she didn't need to repeat the words in level I A, has studied the fewest words of anyone in her age group. This would seem to indicate that she wasn't working to her capacity. While another child (Bob) even though he needed to begin at the first level, pushed forward studying more words than any child in the room.

After comparing the California Achievement Test scores of the children in spelling with the spelling levels on which they were studying, the test scores in the main were just slightly below the studying levels. This would seem to indicate that the children were working about to capacity.

SPELLING RECORD

	96 words	149 words	159 words	224 words	237 words	268 words	187 words	173 words	
	Level I A	Level I B	Level II A	Level II B	Level IIIA	Level IIIB	Level IVA	Level IV B	
	Group 1-------17	Group 1------29	Group 1-------28	Group 1-------40	Group 1-------30	Group 1------35	Group 1------30	Group 1-------31	
Second Year									Words Studied
Colleen		- - - - - -	- - - - - -	- - - - - -	- - - - - -	- - - 4.6			810
Bob	- - - - - -	- - - - - -	- - - - - -	- - - - - -	- - - - - -	- - 4.5			856
Joe		- - - - - -	- - - - - -	- - - - - -	- - - - - -	- - - 4.6			810
Marlin	- - - - - -	- - - - - -	- - - - - -	- - - - - -	- 4.0				630
William	- - - - - -	- - - - - -	- - - - - -	- - - - - -	- - 4.2				680
Joyce	- - - - - -	- - - - - -	- - - - - -	- - - 3.8					610
Carolyn		- - - - - -	- - - - - -	- - 3.7					520
Deniece	- - - - - -	- - - - - -	- - - - - -	- - - - - -	- 4.0				630
Monty	- - - - - -	2.0							96
First Year									
Tonya	- - - - - -	- - - - - -	3.0						245
Carla	- - - - - -	- - - 2.7							200
Dave	- - - - - -	- - - - - -	3.0						245
Mel	- - - - - -	- - 2.6							180
Peter	- - - - - -	- - 2.6							180
Paula	- - - - - -	- - - 2.7							200
Mike	- - - - - -	- 2.5							140
Pat	- - - - - -	- -2.5							140
Tom	- - - - - -	- -2.5							140
Don	- - - - - -	2.0							96
Marge	- - - - - -	2.0							96

GRADE PLACEMENT

California Achievement Test

SPELLING

	Test 1964	Test 1965	Actual Grade Placement 1965	Above Grade Placement 1965
Colleen	3.3	4.2	2.9	+1.3
Bob	2.7	3.7	2.9	+ .8
Joe	2.5	4.2	2.9	+1.3
Marlin	---	3.9	2.9	+1.0
William	2.3	4.1	2.9	+1.2
Joyce	2.1	3.9	2.9	+1.0
Carolyn	2.5	3.7	2.9	+ .8
Deniece	1.9	3.3	2.9	+ .4
Monty	1.2	1.4	2.9	+1.5
Tonya		2.5	1.9	+ .6
Carla		2.2	1.9	+ .3
Dave		2.5	1.9	+ .6
Mel		2.2	1.9	+ .3
Peter		1.4	1.9	- .5
Paula		2.3	1.9	+ .4
Mike		2.1	1.9	+ .2
Pat		1.9	1.9	+ .0
Tom		2.3	1.9	+ .4
Don		1.7	1.9	- .2
Marge		1.9	1.9	+ .0

The average number of years above grade placement for the children was:

For first year children	1965	+ .2		
For second year children	1964	+ .1	1965	+ .7

-Mathematics: - Greater Cleveland Mathematics is the course used in the Bicknell Elementary School. The teachers have found that the Greater Cleveland Mathematics material can be used in an ungraded situation and produce desired results. Some of the procedures that have improved the program this year are:

1. The teachers examined all the sheets in each box for all three grade levels. These sheets were all indexed and filed according to concepts and sheet number. This made it possible for the teacher to select the sheets for individual needs very quickly. The more capable children could get this material for themselves.

2. A folder or packet was provided for each child in which he kept his math material.

3. A record card was provided for each child on which he recorded his mathematical scores.

4. The record kept by the teacher helped a great deal. This record book was so arranged that the teacher could see at a glance which students were ready to be instructed in a new concept.

The mathematics program was more individualized this year. The usual daily procedure went like this. At the beginning of the class, the captains passed the folders to each child. The child would begin working on sheets from his folder. (In the meantime the teacher had checked her record and found that a few children needed help on a certain concept. She called these people together for more instruction.) As soon as a child finished working a sheet of math, he checked the sheet using the teacher's manual as a key. He checked and wrote his score on the sheet with a colored pencil. Then he compared his score with the possible score. If he missed any problems he returned to his seat and re-worked the problems before going to another sheet. All math sheets were re-checked by the teacher to discover the areas in which the students needed help. The children's scores were recorded in the teacher's record book. The following day the sheets were returned to the students. They recorded their score directly under the possible score as indicated on the chart.

Children were free to go at their own speed within a given concept, the minimum being one sheet, and the maximum three sheets a day.

The teachers felt the the children gained much from checking their own work and keeping their own progress record. The children seemed to enjoy the S. R. A. math very much this year.

Note: From the results of the achievement test in mathematics, most of the children did better in the arithmetic fundamentals than in the arithmetic reasoning. This seems logical, however, the teachers have the opinion that the Greater Cleveland Math should include more story problems in the program.

Note: The wide range of ability in mathematics among the children in the room. The range is from 1.8 grade placement to 4.9.

SECOND YEAR MATHEMATICS

TEACHER'S RECORD

	Sums one through six			Combinations zero through six			Combinations less than ten			The associative property		Sums eleven through fifteen			
Sheet Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Possible Score	16	30	16	16	55	40	14	20	16	30	18	16	20	24	40
Colleen	15	30	16	15	51	38	14	20	15	30					
Bob	16	30	16	16	55	40	14	20	16	30	18	16	20	24	40
Joe	14	29	15	13	50	37	14	20	14	27	13	15	20	22	40
Marlin	16	28	16	14	45	40	12	20	10						
William	15	30	11	16	51	40									
Joyce	16	30	16	15	53	40	13	20	15	30	15	13			
Carolyn	14	30	16	15	51	40	14	20	13	30					
Deniece	15	30	16	12	50	40	12	20							
Monty															
Tonya	16	30	16	15	55	40	14	20	14	29	17				
Carla	15	29													
Dave	16														
Mel	16	30	15	14	50	37	12	17							

MY RECORD

NAME________________________

SECOND YEAR MATHEMATICS

Sheet Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Possible Score	16	30	16	16	55	40	14	20	16	30	18	16	20	24	14
My score															

Sheet Number	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Possible Score	30	23	8	18	30	20	20	16	20	24	24	12	43	5	5
My score															

This is the student's record.

GRADE PLACEMENT

California Achievement Test

ARITHMETIC FUNDAMENTALS

	Test 1964	Test 1965	Actual Grade Placement 1965	Above Grade Placement 1965
Colleen	2.9	4.7	2.9	+1.8
Bob	3.1	4.9	2.9	+2.0
Joe	2.7	4.9	2.9	+2.0
Marlin	---	4.8	2.9	+1.9
William	2.9	4.1	2.9	+1.2
Joyce	2.7	3.5	2.9	+ .6
Carolyn	2.5	4.0	2.9	+1.1
Deniece	1.8	3.5	2.9	+ .6
Monty	1.2	2.1	2.9	- .8
Tonya		3.4	1.9	+1.5
Carla		2.7	1.9	+ .8
Dave		1.9	1.9	+ .0
Mel		2.2	1.9	+ .3
Peter		3.1	1.9	+1.2
Paula		2.9	1.9	+1.0
Mike		2.1	1.9	+ .2
Pat		2.7	1.9	+ .8
Tom		2.2	1.9	+ .3
Don		2.7	1.9	+ .8
Marge		1.8	1.9	- .1

The average number of years above grade placement for the children are:

For first year children	1965	+ .6		
For second year children	1964	+ .6	1965	+1.2

The results of this test show that there were only two children who did not achieve above their grade level.

There were two children who were two grades above their actual grade level and seven more who were more than one grade above.

GRADE PLACEMENT

California Achievement Test

ARITHMETIC REASONING

	Test 1964	Test 1965	Actual Grade Placement 1965	Above Grade Placement 1965
Colleen	2.0	3.8	2.9	+ .9
Bob	2.8	4.3	2.9	+1.4
Joe	2.5	4.2	2.9	+1.3
Marlin	---	4.0	2.9	+1.1
William	2.0	3.7	2.9	+ .8
Joyce	1.6	2.8	2.9	- .1
Carolyn	1.8	3.8	2.9	+ .9
Deniece	1.7	2.9	2.9	+ .0
Monty	1.3	1.6	2.9	-1.3
Tonya		2.4	1.9	+ .5
Carla		1.9	1.9	+ .0
Dave		2.0	1.9	+ .1
Mel		2.2	1.9	+ .3
Peter		1.9	1.9	+ .0
Paula		2.1	1.9	+ .2
Mike		1.7	1.9	- .2
Pat		1.5	1.9	- .4
Tom		1.5	1.9	- .4
Don		1.8	1.9	- .1
Marge		1.5	1.9	- .4

The average number of years above grade placement for the children are:

For first year children	1965	+ .0		
For second year children	1964	+ .1	1965	+ .5

-English::- Most of the English lessons were worked out as a group, and the motivation for these lessons came from the child's contributions, experiences and interests as developed from the social studies or science units and seasonal activities.

The practice in the use of oral language was provided by the presentation of news stories, group discussions in social studies and telling stories from library books.

These oral discussions provided experiences in proper grammatical usage also pronunciation and enunciation. When there was need for special drill in correct usage, drill work was provided at the proper level on ditto sheets.

-Social Studies and Science: - Social studies and science lessons were experienced by the entire group of children. Each child had a part in this lesson and was made to feel that he was an important part of the group. Usually when the children were divided into committees or groups to work on a certain assignment or problem younger children worked with older ones. Special assignments were given to children according to their ability.

Other subjects such as art, music, dancing, health, physical fitness, safety, etc. were taught either by team teaching in a group, or by each teacher in her own room.

GRADE PLACEMENT

California Achievement Test

ENGLISH

	Test 1964	Test 1965	Actual Grade Placement 1965	Above Grade Placement 1965
Colleen	2.6	4.2	2.9	+1.3
Bob	2.2	4.1	2.9	+1.2
Joe	2.6	3.9	2.9	+1.0
Marlin	---	3.8	2.9	+ .9
William	1.7	3.9	2.9	+1.0
Joyce	1.6	3.2	2.9	+ .3
Carolyn	1.7	3.7	2.9	+ .8
Deniece	1.6	3.1	2.9	+ .2
Monty	1.5	1.6	2.9	-1.3
Tonya		2.1	1.9	+ .2
Carla		1.9	1.9	+ .0
Dave		2.1	1.9	+ .2
Mel		1.4	1.9	- .5
Peter		1.9	1.9	+ .0
Paula		1.9	1.9	+ .0
Mike		1.6	1.9	- .3
Pat		1.5	1.9	- .4
Tom		1.8	1.9	- .1
Don		1.3	1.9	- .6
Marge		1.4	1.9	- .5

The average number of years above grade placement for the children are:

For first year children 1965 - .2
For second year children 1964 + .0 1965 + .6

Note: The results of this test show that first year children have not done so well in English either year,however, the second year these same children have made a rapid gain. They are now all above grade level except the one child.

GRADE PLACEMENT

California Achievement Battery

	Test 1964	Test 1965	Actual Grade Placement 1965	Above Grade Placement 1965
Colleen	2.6	4.3	2.9	+1.4
Bob	2.5	4.4	2.9	+1.5
Joe	2.5	4.3	2.9	+1.4
Marlin	---	4.1	2.9	+1.2
William	2.0	3.9	2.9	+1.0
Joyce	*1.8*	*3.3*	*2.9*	*+ .4*
Carolyn	1.8	3.7	2.9	+ .8
Deniece	1.7	3.3	2.9	+ .4
Monty	1.2	1.6	2.9	-1.3
Tonya		2.6	1.9	+ .7
Carla		2.1	1.9	+ .2
Dave		2.2	1.9	+ .3
Mel		2.0	1.9	+ .1
Peter		2.0	1.9	+ .1
Paula		2.0	1.9	+ .1
Mike		1.9	1.9	+ .0
Pat		1.8	1.9	- .1
Tom		1.9	1.9	+ .0
Don		1.6	1.9	- .3
Marge		1.6	1.9	- .3

The average number of years above grade placement for the children was:

For first children	1965+	+ .1		
For second year	1964	+ .1	1965	+ .8

According to the results of the test given, the first year children have achieved on the average one grade level.

The second year children have made a greater gain. Some of these children have made a gain of one and one-half years.

Evaluation - The outstanding feature of the individualized program is that it allows each child to work at all times at the instructional level which fits his educational foundation and mental maturity.

It is my opinion that most of the desired outcomes that were set up at the beginning of the year are being accomplished.

I feel that we are meeting the individual needs of the students better than at any previous time.

I believe that students are better thinkers and more independent workers than students that I have taught in previous years.

Students seem to be well adjusted socially and accept students of different ages.

In this program there is no stigma attached to the slow student who is unable to keep up with the faster students.

From the achievement test and statistical data available we have observed the following conclusions.

That on the average the children have made a greater gain in all the subjects taught in the individualized program than in the former graded school.

We have discovered that in most cases the same children made a greater gain the second year in the program than they did during the first year.

Statistical data proves the point that children have special ability in different subjects, for example the best readers in the room were not the best students in mathematics. This helps the teacher to use flexible grouping and individual instruction to meet the needs of all the children.

The results from the test given this year in my room, show that the children made the greatest gain first in mathematics, second in spelling, third in reading and fourth in English. The pattern hasn't been the same every year except that English usually shows the least gain.

According to the results of the achievement battery test which was given to the children in my room this last year, sixteen of these children were above grade placement and four were under grade placement. These children ranged from -1.3 to +1.5 above actual grade placement.

I feel that the children enjoy working in this program and that most of the parents are well pleased with it.

For example: This last year, since there were only first and second year children in the unit, it was the policy that these children were to go home on the 2:30 bus unless the child brought a note from the parent stating that he might stay. It was surprising to find the number of children who often stayed. The parent would write,"Bob would like to stay to school later today, he said that he would like to finish some math, or he would like to work on the project that he didn't have time to finish yesterday."

The four years that I have been working in this individualized program have been most challenging and most interesting. The growth the children have made has been most rewarding.

I do like the program and I hope that it continues in our school.

PROMISING PRACTICES FOR IMPROVING INSTRUCTION IN SMALL SCHOOLS

Practice 3
Individualizing Instruction in a Small Elementary School
Part II

Bicknell Elementary School
Bicknell, Utah

A Project of
The Western States Small School Project

Utah State Department of Public Instruction
Dr. T. H. Bell, Superintendent
Room 223 - State Capitol Building
Salt Lake City, Utah

PART II
INDIVIDUALIZING INSTRUCTION IN A SMALL ELEMENTARY SCHOOL

Wayne County District	Arthur H. Lee, Superintendent
Bicknell Elementary School	Lorenzo D. Hallows, Elementary Supervisor
	John A. Brinkerhoff, Principal

Contributing Teacher(s)

Golda Jackson
Venettia Allen

* * * * * *

General Description - (a) Problem to be solved
(b) Desired outcomes
(c) Grades, pupils, and teachers involved. School situation.

In the spring of 1961, the teachers of the Bicknell Elementary School were informed that because of the decrease in enrollment for the coming school year, there would only be five classroom units. This would mean a combining of grades in some way for the next school year.

Immediately we began to look for the best way of doing this. We felt that whatever arrangement was made, it should mean improvement over the present program, if possible.

As teachers we began to search for helps and guidance in the best and most effective way to handle the problem, and it was decided that to visit a school where grades were being combined into one classroom unit would be helpful. The Manti Elementary School was trying such a situation and so by invitation we attended for a day. They were very kind in sharing their ideas, and in helping us to see some of the problems that we were going to face.

The next step was to decide on the placement of the children. After some time and consideration it was decided that the first, second, and third grade children should be grouped into two classroom units under two teachers, Mrs. Golda Jackson and myself.

In order to avoid the stigma of fast and slow groups, the children were given a standard test by the supervisor and then they were divided in such a way that each teacher had a mixed group of both slow and fast students.

Some of the procedures by which we felt we could improve our teaching and the learning progress of the children were:

(a) Let the children choose their own desks, or be mixed together so that the seating arrangement would be governed by the social and physical attractions and differences of the children.

(b) Allow children to travel at their own rate of speed.

(c) Let children move on to faster groups as soon as they were ready.

(d) Let the children remain a longer period with the same teacher.

(e) Let older children facilitate the learning of the younger ones.

(f) Use ungraded working groups, governed by the childs ability and achievement rather than his years of school.

(g) Teach in small clusters or groups rather than the whole group at once.

Some of the desired outcomes, or objectives we hoped for by this change in our classroom, were:

(a) To create a greater interest in learning, by meeting the individual needs of children in a better way.

(b) To help children to be more secure socially, emotionally, and mentally.

(c) To let the teacher become better acquainted with the child, making it possible to better understand his problems, needs, and capabilities.

(d) To take care of the variation in time element, thus eliminating wasted time and decreasing the discipline problem.

(e) To better social adjustment; and develop respect, tolerance, and understanding in children toward their classmates.

(f) Through the small cluster method try to reach each child personally in the specific training needed.

(g) To introduce and train children in independent reasoning, good study habits, application to their work, and proper record keeping.

(h) To help children measure their growth by the progress shown on a record sheet, and use it as a guide to further experiences.

Preparation - During the vacation time of this first year, Mrs. Jackson and I spent time discussing our problems and planning work for this new arrangement. Before school started in the fall of '61, we went over the texts to be used, making outlines and preparing materials that we felt would help us to accomplish our objectives. Together we made plans, and chose units of work for the coming year. We tried to visualize and prepare the materials we had, so they would be used to the best advantage in our mixed groups. In some ways it was a trial and error experience, but many of the plans we prepared proved to be useful. As time went on we discarded and replaced with better and more applicable materials.

The superintendent, supervisor, and principal were aware of our needs and did what they could to get us new materials and help in how to use them. We worked very hard to adjust both ourselves and the children in every way; sometimes we were discouraged, but we could also see the possibilities of a better plan of teaching and we became converted, so tried in every way to make the plan work for our school.

The following year of 1962-63 we were accepted as a participating school in the Western States Small School Project. Before school started we attended a workshop held at the Brigham Young University for the purpose of training and informing teachers of the procedures in small school projects.

We came home from this very fine workshop filled with enthusiasm and a desire to make our project accomplish all our objectives and prove a success.

We were given a consultant, Dr. John Crnkovic of the Brigham Young University Laboratory School to help us with this work. We were invited to visit the training school during the winter, and later we did. We observed classrooms where progressive teaching was in progress. Mrs. June Searle, a teacher at the school, and who later replaced Dr. Crnkovic as our consultant, was a vital help to us with all the ideas and materials she had worked out and prepared for the project.

During this first year in the project, Dr. Crnkovic introduced the new spelling program into our school and helped us to get started in it. Later he helped us with the S.R.A. Reading program.

The next summer, 1963, we were invited to attend another workshop, this time at Logan, and here we received more intensified training in classroom procedures.

The following winter the S.R.A. Reading program was extended beyond our units in order for the children who had been in the program the year before to carry on this work. The spelling program was already in use by all the grades.

The Greater Cleveland Mathematics Program was introduced to us about the middle of the year 1962-63, and we tried after the holidays to combine the sheets with our text-book program, but found this was too confusing to the children because of the difference in terminology. We then transferred to the new material. As we worked with this material we found that as published it was not adapted to an individualized use such as we were trying. It was necessary to go over the material and work out a system by which we could individualize the sheets to meet our needs.

The school year of 1964-65 brought a new problem to our school. The room population had shifted so that in order to handle the grades, the grades had to be shifted again, thus changing the units.

Before school started we attended another workshop at the B.Y.U. and with the help of our consultant and supporting faculty, plans were made for the coming year. The first two units were made up of first and second grade children; the fourth grade teacher, Mrs. Ethel Durfey, was given a classroom unit of third and fourth grade children.

This new arrangement meant adjustments, especially for the teachers. In a small school the grade population is an ever changing problem and each year there are some changes to be made, but that is part of this accelerated program--change and challenge.

I am sure this next and coming year will bring some more changes, but it will also bring new and exciting ideas, materials, and experiences. I hope that whatever the changes to be made, that the new and accelerated progressive program will remain a part of the future for the school.

Practice - At the beginning of the year, in this first year of our new program, the children were allowed to choose their own desks wherever they wished to sit. If this seemed to be satisfactory for learning and social adjustment, children were left together, otherwise changes were made as they were needed.

The opening exercises of the day were conducted much as they had always been, with the whole group participating. At this time the mood for the day was set; it was a time where understanding and respect for the contributions of each child was promoted. The daily program was worked out with the children.

Whatever the subject of the first class of the day, (the subject stemming from childrens interests and contributions), from this period was selected words for phonetic study; functional words for the spelling list; and topics for writing and art practices of the day. The subject could be science, social living, or a language lesson about some activity or unit to be carried on later.

Because good study habits are very essential to a child's secureness and composure, and since materials and methods were new to those who had started by the old plan, reading, arithmetic, and spelling classes were conducted at the same time each day, as nearly as possible. With the introduction of each new material, extra time and emphasis was placed on the subject. Spelling was the first new material to be introduced so special time and training was given; as a result the children responded especially well and liked the program. Each new material was treated the same way, with the same results.

After the first period in the morning, we went to the reading program. There were other times during the day when reading classes were held, but for the next forty-five minutes, the basic reading program was conducted.

Our reading program was organized into four parts, namely,-

(a) Basic reading
(b) Self-selection reading
(c) S.R.A. reading
(d) Library reading

During the first reading period of the day, all children were engaged in reading. The first years of this new program, all the children were grouped and given a basic reader to begin with, but later, this past year, by our consultants advice, the children were treated more democratically by letting them choose a book as they liked from the book shelves; then through the process of choice and elimination, and help or counseling of the teacher, clusters and groups were organized and the basic reader introduced.

Beginning children were also treated democratically by letting them all start out in the same group and on an equal basis, until they themselves, because of varying readiness, could be organized into comfortable groups for teaching. In the reading groups children were taught to understand content and interest in the story promoted. Word study and phonics were given.

After the formal reading groups, first year children were given some enrichment material until they were able to read enough to join the selective reading program. The other children, as soon as they had finished their lessons went into the selective readers. As children became better readers they were not required to come to regular groups, only as they needed special help, were they clustered for training.

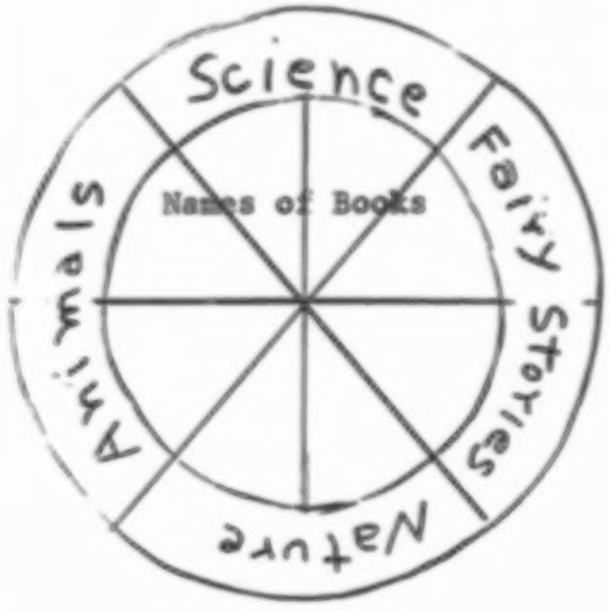
For the selective reading program, the children chose a book from a place where books of a wide range of reading level and interests had been placed by by the teacher. The child chose a book that he liked, felt comfortable reading, and did this reading at his desk or at some restful place. A record was kept by the child of every book, its title, the date and the pages read each day. When the book was finished the child colored a section of a wheel that was pasted in the notebook. The children liked this way of keeping a record of their reading.

Here is a sample of the record sheet of the notebook, and the wheel marking the completion of a book.

Page from notebook

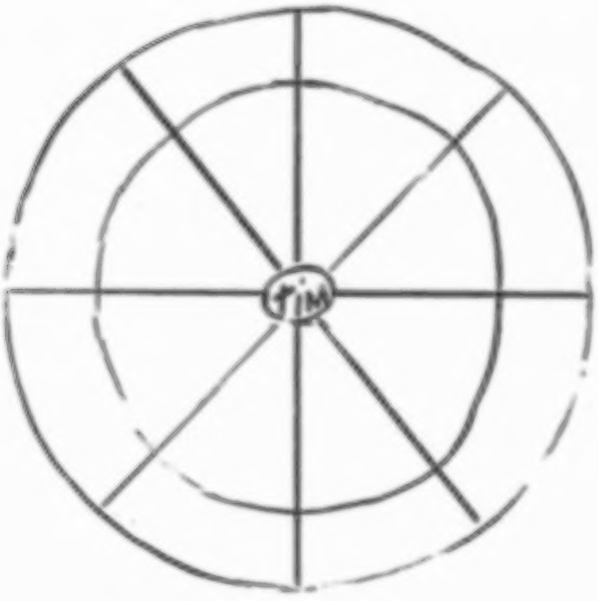
Name of Book	Date
	Pages read
	Date
	Pages read
Name of Book	Date
	Pages read

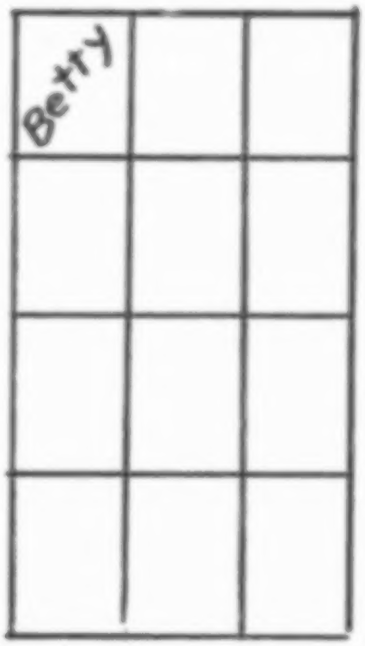
Pasted wheel

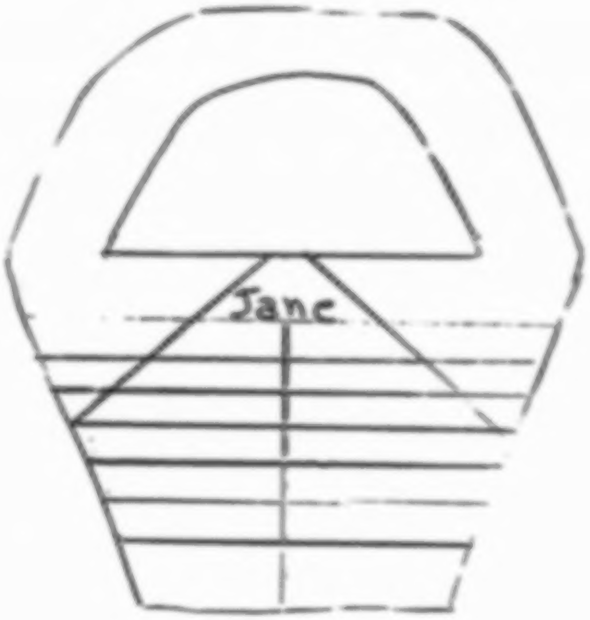


The third part of the program was the S.R.A. Reading. This was sometimes used in place of the selective reading, but always as a supplementary program. This reading was not started until most all the children were capable of using the stories, and then the first step was to give the children experiences with the word games and introduce the series of listening stories and the recording system. Later and usually following the holiday vacation, the children started to use the story cabinet. The stories were very interesting to the children. The stories are full of interesting information and the children liked the word games and record keeping that followed each story.

The fourth and last phase of the program was called Library reading. This part was planned to save time for the teacher; give the children free reigns in independent reading, self-selection, keeping their own library card, and to promote reading experiences in the home with the parents. Each child was provided as often as he needed one, with a library card made from tagboard and marked into sections.







This was his library card and on it he wrote the name of the book he took home. Books were selected without the teachers help, from trade books, library, and bookmobile books.

When the books were returned with a note from the parent saying the child had read the book, a star was placed by the name of the book on the card. These cards were placed in a special place in the room, and when a card was finished the child took it home to his family.

The responsibility of reading these books rested entirely with the parent and the child; it was also a means of letting the parent see the progress in reading. My only responsibility here was to let the child tell me now and then about the interesting parts of stories, and keep track of the books read.

One needs to understand children to know how important an improvised detail on a card can be to the child. It was amazing to see the high rate of enthusiasm this reading created in the children toward home reading. The best books became good conversational pieces and all the children participated, from the little slow reader who was proud to have a card with a dozen books listed, to the child who read 200 books during the school year.

The arithmetic instruction came immediately following recess. The first year we tried to streamline the texts to meet the needs of our changed program, but with the introduction of the new modern math (greater Cleveland), into our school, and after a careful study of the material, we found it necessary to introduce and teach each new principle and concept, because the mathematical terms were different and there were new approaches to concepts. We decided to teach all the children, regardless of grade, step by step from the very first of the series. In order to save time and give the older children the background they needed in this new material, we taught the lessons to the whole group at once. After each formal instruction the children were given work sheets from their own grade level on the subject taught. This presented a problem for concepts were not placed in the same area of each grade cabinet. It resulted in some confusion. The new material had not been organized for individualized teaching. With the help of our consultant, Mrs. Searle, we grouped and filed the sheets in the cabinets, and labeled the different concepts so they were easy to find; then we set up a system of finding, checking, and recording sheets that could be done by the children under the teachers supervision; this saved a lot of time and confusion. A folder or pocket was provided for each child in which he could keep his sheets and a record keeping chart for his own use. We found this helped us very much and promoted the type of progressive system we wanted.

Teachers kept a progress record of each child for the purpose of a quick check to see where the child was in his work and where he needed extra help. The cluster plan was used for the extra teaching of concepts, and repeat work. Children corrected their own sheets and every sheet was reworked and corrected while it was fresh on the child's mind, (an extra reinforcement in learning); then the child was permitted to go on.

I feel that this material and the process of using it has given the children a greater understanding of sets, groups, symbols, comparisons, equations, types of measuring, telling time, etc., and newer, more meaningful ways of approaching addition, subtraction, multiplication, and division.

We learned that the old texts and the new material could not be combined because of the terminology and approach with young children. I wonder if the children have some of this same problem, when they take the yearly test for achievement. It would help to have the tests prepared by the same people who prepare the sheets they work. They might have rated higher, however, generally speaking, the children went above their grade placement in most cases and some as much as 1.5 higher. This same spread might be found under the old plan, but in this program the child with the potential to travel ahead may do so, while all the group have a feeling of composure and security traveling at the speed they are capable of.

The new spelling, and the physical activity period were the two subjects that were stable for the afternoon schedule. All other subjects and projects of the day were sometimes changed and arranged to fit the needs of the children. As nearly as possible we held these subjects to a definite habit forming time because of their importance to the child,--health for health's sake; spelling, arithmetic, and reading because they were the part of the daily program where the most adjustments were made. This was true of the first two years because children had already been started with the old plan and materials, after that it seemed the best way, so we continued the same way.

The new spelling program was introduced into our school the very first of all the new materials, and was developed by the B.Y.U. Laboratory School.

This program consisted of a set of books of graded levels, each containing lists of words for spelling, and a paragraph on phonics related to the words in the list. Each list and instruction in phonics was called a group, as, group 1, group 2, and so on. The books were called levels, as, level IA, level IIA, level IB, etc.

The first step in this procedure was to give a placement test (provided in the instructions), to the second and third grade children, to indicate the book level for the child to start in. The children were given a copy of these instructions to follow.

1. Read the instructions at the beginning of each list.
2. Print the instruction.
3. Read the words.
4. Make a sentence with the words indicated by a star.
5. Print the words.
6. Study the words (spell them to yourself).
7. Print the words again.
8. Test with your partner.

Children pasted this copy in the front of the notebook and then before they began, a few sample lessons were given to the whole group to make sure they understood what to do and how to go ahead on their own.

The capable children worked with a partner, following the instructions; the teacher worked with slow children and gave group tests during class time. The beginning children came into the program later when they were ready for it.

A unit test was given at the end of each level completed before the child could go on. The test was given by the teacher, and some children learned the words and passed the tests on as many as six levels during the year. There was no stigma attached to spread in the childrens achievement in spelling. Children liked the program, they liked working with a partner and the self checking part in the work.

At the beginning of school each year children were given the placement test over again so they could start where they needed to. This way there was opportunity for review each year.

The functional words chosen each day were added to the groups of words to be studied.

All other work was taught mostly to the whole group at the same time. Children contributed according to their interest and ability. Social living and science were taught as units; much of the English was taught individually through the written work of the child. Spelling and writing were also helped in this way.

Some team teaching was done. Not only did we organize and plan together, but we put all the children together at times for instruction and activity.

We planned together for the use of such materials as phonographs, projectors, film strips, and tape recorders. We worked on materials for programs and social activities. I think we tried very hard to synchronize the program and were successful in having both teachers and children work well together. Evaluation - We found both advantages and disadvantages in this program, but I feel that with experience and growth many of the problem areas will be taken care of. For three years we felt that the extreme difference in ages of first and third grade children was in some ways a problem, but this past year, with two grades, we realized that the span and spread of childrens ability and growth is always there and we did miss the mature influence and capable help of the older children. So what seemed a problem, only needed more understanding and time to work out the minor details; this is probably the answer to other disadvantages.

Record keeping and filing of material demands a great deal of time and makes extra work for the teacher.

The child keeps many records for himself, but that is part of the learning process for him; the teacher must still keep her own files and record charts for the purpose of knowing the child's progress, where he needs special help and as a check against his record.

I am converted to record keeping and to progress charts of the childrens' work, but I also feel that with the extra work for the teacher, it is easy to let this phase of the program get out of balance. Teachers need to be careful in budgeting time so that record keeping will not crowd out time needed for lesson preparation. Secretarial help is useful to the teacher, so that she may not shorten preparation time but if anything enlarge on it. Individualized teaching needs a great deal more time than the old plan, where all children are taught from the same page at one time.

All the children were accepted by the group. Age and achievement did not seem to make any difference in a social way. The independent and responsible way in which most children responded to their work was a joy to the teacher. The discipline problems that are caused by children having to wait for each other were not there. Children are anxious to continually move on, but they rebel sometimes against busy work, just work to keep them busy. Children were interested and happy in being able to go ahead with their work, and usually did so without urging from the teacher.

Cheating was practically unknown. Now and then a child would be too anxious to get the right answer the quickest way, but by constantly teaching them to understand the why of these new methods of learning, very few instances came up that could be called cheating.

I feel that we have met the individual needs of children better in this individualized program, and that they are better adjusted. The slow children of the room were not affected by the faster ones, in that way they felt insecure. To me the area of the most growth in all the children was not in the subjects taught, although the growth there was very good, but in the personality of the child. His ability to think better, adjusting socially, and going ahead independently, these areas that cannot be measured exactly, were changed the most, and growth in mental maturity toward self-independence. There was growth in the feeling of security and belonging in the child. The close individual work between student and teacher was very helpful to the child in helping him to feel at home.

Mrs. Jackson has in her report all the detailed statistical data of the test results and in a general way it is the pattern of both units. I will not attempt to give the same report here.

I want to say that to me this pattern of procedure in the classroom is a far better way to teach children and develop all their potentialities. I hope the program stays in the school.

The grouping of children and grades may change, but to me, the individualized plan for teaching children is, by far, the best approach to teaching.

I have been happy working in the small schools project, and am grateful to all those who have helped me and that I have worked with.

Materials and Resources - The Bicknell Elementary School building is new and is modern in most every respect. The teachers in the school really appreciate the fine equipment and all the new wonderful materials that are available for use in our school. Some of these items are:

- Overhead projector
- Movie projector
- Slide and film strip machine
- Tape recorders
- Opaque projector
- Ditto machine
- Copying machine
- Microscope
- Record players
- Primer typewriter
- Movable blackboards
- Flannel boards
- Counting frames
- Counting man
- Number lines
- Games and flash cards
- Lincoln logs and blocks
- Easels
- Chart holders
- Paper of all kinds
- S.R.A. Reading labs.
- S.R.A. Mathematics program
- Spelling folders
- Books (including many new basic readers, supplementary readers, and trade books.)

We also have television which will be ready for this coming year.

PROMISING PRACTICES FOR IMPROVING INSTRUCTION IN SMALL SCHOOLS

Practice No. 4
Individualizing English in a Small High School

Bryce Valley High School
Tropic, Utah

A project of
The Western States Small School Project

Utah State Department of Public Instruction
Dr. T. H. Bell, Superintendent
Room 223, State Capitol Building
Salt Lake City, Utah

INDIVIDUALIZING ENGLISH IN A SMALL HIGH SCHOOL

Garfield County District	Russell Merrell, Superintendent
Bryce Valley High School	Kerry D. Nelson, Principal

Contributing Teacher(s):

Marian Shakespear
Dar Smith
Kerry D. Nelson

* * * * * *

General Description -

(a) Problems to be Solved:

Many of our students were not getting adequate education in English. The slower students were getting farther behind as the years went by; the faster students were wasting much time and were getting lazy habits. The English teacher was so swamped with correcting she had little time for preparation and real teaching.

(b) Desired Outcomes:

Our aim, then, was to individualize our instruction, to give each student a program which would fit his individual needs and encourage personal responsibility. By using a lay person to assist in testing and correcting we hoped to relieve the teacher for her most important function, planning and teaching.

(c) Grades, Pupils and Teachers Involved:

This program involved all pupils in grades seven through twelve. Their approximate mental ages ranged from seven to twenty years. Our team was composed of two teachers, a study supervisor, and a lay person who tested and checked papers.

(d) Our School:

Most of our students come from low to medium income families. There are very few children whose parents are professional people. About a half of our students are brought in from surrounding communities by bus. It is a small school of about 155 students. The school population is fairly constant.

Preparation - The organization of the Western States Small Schools Project gave us the backing we needed to initiate our new program. A workshop at Utah State University oriented us, giving us ideas and information gained from similar experiments in other schools. We used many of these suggestions relative to format and materials.

Practice - We started our program using two study rooms, a small testing room and the library. We later tore out two partitions, making one large study room. In the corner of this room we made a testing center, supervised by a lay person who administered the tests and checked papers. The library was used for group discussions and as a research center. The principal, Mr. Nelson, supervised independent study. Two teachers, Mrs. Shakespear and Mr. Smith, were available to the students for consultation, oral reporting and group discussions. The junior high section met the first hour and were followed by the senior high group.

During the first week, each student was given his course outline, his own graph for his personal record (his expectancy level was indicated on his graph), and a list of the materials he would need. Each program was explained in an individual conference between student and teacher.

As a student completed a unit of work, he requested a test, or, in some cases, an oral discussion. If he passed the test, he would record the test results on his graph. If his score did not come up to his expectancy, he would come to the teacher for discussion of the test material. When he felt prepared, he would then take another test covering the same material.

The teacher scheduled individual or group conferences when tests indicated a need.

At the end of each six weeks, a throw-away report card indicating student progress was issued to the student. No grade was given.

The student's work was evaluated at the end of the year. If the student had completed his course, he was given a full credit. If he had not completed his outlined course, he was given that fraction of credit that he had earned. In some cases additional credit was given, for additional work.

Evaluation -

(a) Student Reaction:

Student attitude toward the program was generally favorable. Greater student responsibility was noted. Slow students showed renewed interest. Student achievement was as good as, or better than that noted in the conventional program.

(b) Teacher and Administrator Reaction:

Teachers and administrators were enthusiastic about the program. Some relief from paper correcting and supervision left the teacher more time for actual planning and teaching. Having two teachers, working as a team, gave the advantage of utilizing the strengths of each. The challenge of the experiment was stimulating and revived enthusiasm and interest. The fact that students initiated most of the requests for help when they felt the need for help made them much more receptive and teachable.

(c) Parent Response:

We have had general approval from parents who were acquainted with our program.

(d) Other Observations:

We have not yet achieved the degree of success in speech we would like. We could do this with more planning time for speech units. We felt that our writing reached a higher level of organization this past year. Literature units need to be expanded. We hope to initiate two regular study and discussion groups aside from the regular program, one for college-bound seniors, another for students who lack initiative, whose progress is sub-standard.

Materials and Resources -

Literature:

Library Books (Classics, travel, biography, etc.)
Literature Units (Teacher-made, student-made)
Scholastic Literature Units (Scholastic Book Services)
Literature Sampler (Learning Materials, Inc., Encyclopedia Britannica, Inc.)
Anthologies (On hand from previous years)
Films (Borrowed)
Tapes (Teacher-made, student-made)
Records (Scott, Foresman and Company) (L. W. Singer)
Paperbacks

Language:

2200 (Harcourt, Brace and World)
2600 (Harcourt, Brace and World)
3200 (Harcourt, Brace and World)
MacMillan Programmed English (MacMillan)
E-F Series (California Test Bureau)
Warriner's Complete Course (Harcourt, Brace and World)
Text Books (Accumulated throughout the years, used for reference and review)
Auditory Unit (Teacher-made)

Spelling:

SRA Laboratory, Spelling (Science Research Associates)

Writing:

A Programmed Approach to Writing (Ginn and Company)
Writing: Unit Lessons in Composition (Ginn and Company)
Beginning Writing Unit (Teacher-made)

Study Skills:

How To Study (American Guidance Service, Inc.)

Reading:

Basic Reading Skills (Scott, Foresman Company)
SRA Reading Lab (Science Research Associates)
Reading the Sure Way, Record and Book (The Institute of Audiographic Arts, Studio City, California)

PROMISING PRACTICES FOR IMPROVING INSTRUCTION IN SMALL SCHOOLS

Practice No. 5

Individualizing and Non-Grading Math in a Small High School

Bryce Valley High School
Tropic, Utah

A project of
The Western States Small School Project

Utah State Department of Public Instruction
Dr. T. H. Bell, Superintendent
Room 223, State Capitol Building
Salt Lake City, Utah

INDIVIDUALIZING AND NON-GRADING MATH IN A SMALL HIGH SCHOOL

Garfield County District

Russell Merrell,
Superintendent

Bryce Valley High School

Kerry D. Nelson,
Principal

Contributing Teacher(s)

Mayo Rich
Afton Pollock
Kerry D. Nelson

* * * * * *

General Description -

(a) Problems to be Solved:

In the past some students entering schools of higher learning did not have all the math they needed to compete with students from larger schools. We realized that in our situation we did not have teachers available for extra math classes. Individualization was difficult, and many slow students felt little success or interest in mathematics.

(b) Desired Outcomes:

We hoped that by instituting a consecutive non-graded program to make it possible for students to learn as much math as their time and capabilities would allow. We hoped to encourage all students to take personal responsibility and to gain a feeling of success in their work. By using a lay person for testing and checking, we desired more teacher time for actual teaching.

(c) Grades, Pupils and Teachers Involved:

All junior high students and about 70% of the senior high students were involved in the new program. The junior high met as a group the 3rd period of the day and were followed by the senior high students. A few students who did not find this time convenient or who wanted additional math arranged for another period during the day. Kerry D.

Nelson, our principal, was assigned the responsibility of the remedial group. Afton Pollock took the responsibility of the junior high course offerings and May Rich the senior high courses. A lay person was in charge of testing and paper checking. We had about 155 students in our school.

(d) Facilities for Teaching:

At the beginning of the year we used one large room containing two teacher stations and a testing area and another smaller room for the remedial students. We later moved all students into the large room, leaving the smaller room available for group discussions.

Preparation - Lacking precedent for a non-graded, individualized math that would fit our particular needs, we found it necessary to do a great deal of individual thinking and planning. The advent of the W.S.S.S.P. gave us the backing we needed. Several sessions with the directors of the project and other outstanding educators supplemented our own ideas and helped us to get the project underway.

Practice - At the beginning of the year, from test results and previous work of students, we determined each student's expectancy level and placed him in the material best fitting his needs.

The student used programmed materials and was instructed to proceed as fast as he could consistent with understanding. The student requested a test at the completion of each unit of work. If he did not pass this test he was required to do more work in that unit and consult with his teacher.

Upon satisfactory completion of a course, the student could move to another. He could earn as many credits as he was capable of earning in each year.

The course offerings were:

Remedial Fundamentals
E-F Series (Addition, Subtraction,
Multiplication,Division)
7th Grade Math
Modern Junior High Math

Basic Math
Basic Math (Problem Solving)
Modern Algebra I and II
Consumer's Math
Modern Trigonometry
Plane Geometry
Solid Geometry
Analytical Trigonometry
Sets, Functions and Inequalities
Verbal Problems
Language of Algebra
Introductory Calculus

A throw-away report card, showing progress of the pupil was issued each six weeks. The teacher kept the record of student progress.

Evaluation - Students taking the ACT test for college entrance averaged between the 78th to 80th percentile. Students completed more units of work than under the traditional method. One student completed all course offerings; six others completed all but one or two. Greater interest was apparent throughout the school. We received favorable reports from our college students who had participated in the program in prior years. As teachers and administrators, we feel we are doing more for the individual student than we have done before. We believe in the program and are continuing our efforts to improve it. Parents are generally favorable to the program.

Materials and Resources -

Remedial Mathematics (Teacher-Made)
E-Z Series (California Test Bureau)
SRA Modern Algebra (Science Research Associates)
SRA Modern Algebra (*Temac*, Encyclopedia Britannica Press)
Basic Mathematics Problem Solving (Addison-Wesley)
Temac (Encyclopedia Britannica Press) All other titles
listed on previous page were *Temac* materials.

PROMISING PRACTICES FOR IMPROVING INSTRUCTION IN SMALL SCHOOLS

Practice No. 6
Modern Mathematics in an Individualized Program

Escalante Elementary School
Beryl, Utah

A project of
The Western States Small School Project

Utah State Department of Public Instruction
Dr. T. H. Bell, Superintendent
Room 223, State Capitol Building
Salt Lake City, Utah

MODERN MATHEMATICS IN AN INDIVIDUALIZED PROGRAM

Iron County District — Ianthus Wright, Superintendent

Escalante Elementary School — M. K. Campbell, Principal

Contributing Teacher(s)

Leda A. Jolley
George M. Jolley
Frank J. Petty (1 yr.)
M. Kay Campbell

* * * * * *

General Description -

(a) Problems to be Solved:

The problem to be solved was that of individualizing our mathematics program, and at the same time introduce modern mathematics on a full-scale basis to grades one through six.

(b) Desired Outcome.

(c) Grades, Pupils and Teachers Involved:

This project took place in a three-teacher school with two grades under each teacher. The enrollment is approximately sixty students housed in a building with four classrooms, one being used as a special activities room.

As we visualize modern mathematics and individualization of mathematics, they might be incorporated into almost any school situation, with the possible exceptions being those conditions where the teacher is responsible to too many students, and also where the teachers are either unable or unwilling to participate in a program designed to prepare them for the changes. A desirable ratio might be approximately one teacher to twenty students.

Preparation - Though this report is being written in the absence of our faculty, I sincerely believe a concensus would be that no step in introducing any new program is more important than adequate teacher preparation.

An article which appeared in "The Arithmetic Teacher," April 1964, written by Clyde G. Corle, stated that ". . .changes which require a reorientation of our intellectual processes come slowly and painfully." Corle suggests at least twelve hours of college credit for adequate teacher preparation in new math before a school is ready to adopt a full-scale new math program. We feel this might be cut down some but not a great deal. We consider our attitude and participation in this new program as being healthy and effective. This might properly be attributed to the following preparatory phases: 1-Three different USSSP workshops. 2-Personalized consultant help from a qualified instructor of the Brigham Young University (Dr. Richard Brown visited our school periodically during one school year). 3-An extension course in current mathematical ideas offered by the Brigham Young University. 4-Mathematics conferences sponsored by the Utah Education Association.

A variety of new materials were obtained which helped to clarify new ideas as well as develop more depth of understanding.

Practices - The new practices now used in our school are basically modern mathematics in an individualized program (I am assuming these terms are appropriate and do communicate). This instruction revolves around three types of communication. First, a one-to-one correspondence which is the most commonly used. Second, a small group situation in which students with common mathematical needs are brought together for a given amount of time. This requires a systematic record keeping arrangement which helps identify problems. Third, an entire class, of blanket type instruction and testing which is least frequently used. This serves the purpose of needed convenience as well as uncovering weaknesses which might be overlooked in the two foregoing types of instruction.

Evaluation - The comments and feelings of students, faculty and parents along with the testing results of the past project clearly bear out that this project under the WSSSP has made a positive improvement in the quality of teaching, the academic improvement of the students, increase in needed facilities and equipment, and general attitude of most people associated with our school. As near as we can ascertain, the most marked improvement in mathematics in the Escalante Valley School has been made under this project. We hope this may serve as a helpful contribution in raising the quality of instruction and student progress in rural schools.

I am unable, at this time, to provide any statistical information on our project. This is due to the fact that I received the request for this report after I had left for and was actively engaged in summer school at Provo, however, since the testing scores will be the subject matter for a masters project, more information and statistical data will be available in the fall of 1965.

In the first year of our project, we individualized our reading program. This was done under approximately the same in-service and advisory system as described in our mathematics project. During this phase an unused classroom was converted into a badly needed and relatively well stocked library.

It is our desire to have another opportunity of participating in a similar program to further improve our facilities, equipment and instructional abilities in the language arts area.

Active support and assistance from the advisory and administrative personnel of the Iron County School District has been appreciated.

PROMISING PRACTICES FOR IMPROVING INSTRUCTION IN SMALL SCHOOLS

Practice No. 7

Individualizing Instruction in High School Language Arts

Milford High School
Milford, Utah

A project of
The Western States Small School Project

Utah State Department of Public Instruction
Dr. T. H. Bell, Superintendent
Room 223, State Capitol Building
Salt Lake City, Utah

INDIVIDUALIZING INSTRUCTION IN HIGH SCHOOL LANGUAGE ARTS

Beaver County District — **Paul Lefevor, Superintendent**

Milford High School — **Jesse E. Long, Principal**

Contributing Teacher(s):

Alice Elmer
Lora Johnson
Dee R. Goble
Nelda Memmott (Remedial Teacher)
Jesse E. Long
Joyce Joseph (Student Teacher)
Frances Goble(Lay Reader)
Pauline Rummler(Secretary and Clerk)

* * * * * *

General Description -

(a) Problems to be Solved:

Improvement in our language arts curriculum to enable us, in a small school, to reach the slow learner as well as accelerate and provide more challenges of the fast learner. The conventional classroom has not enabled us to accomplish the above objective.

(b) Desired Outcome:

We, the Milford High School Language Arts Teachers and Supervisory Staff, endorse a program that will give the students a chance to achieve and progress in an atmosphere conducive to the development of their abilities and satisfaction of their needs. It should, in some way, give a feeling of security and a feeling of accomplishment. It should be geared to the individual student so that his means of communication may be broadened and his interests aroused to do a better job of learning for himself, rather than for the teacher and the grade.

Character is the aim of true education; language arts is but one means used to accomplish this desired end.

1. To develop basic skills, understandings, and attitudes of communication through experiences in speaking, reading, writing, listening and literature.

    (a) Provide a developmental reading program for all secondary students.

    (b) Encourage use of spelling and vocabulary skills at each level of learning.

    (c) Provide experiences in self-expression for each student.

    (d) Instill in each student the desire to attain self-discipline.

    (e) Provide the opportunity for each student to develop the ability to think critically and analytically.

    (f) Provide experiences in literature that will enhance each student's appreciation for aesthetic values and human relations.

    (g) Encourage students to organize and complete the major part of their school work during the regular class periods.

    (h) Stimulate students to read independently outside of the regular literature program for self-improvement.

    (i) Realize that the reading of literature is a creative process in which the reader lives in imagination in a wider world and comes back to his own world with enriched experiences, deepened sympathies, and new insight and understanding.

(c) Grades, pupils and teachers involved. Describe school and situation into which practice must fit:

We decided that since the art of communication is of extreme importance in our modern society that we would individualize our language arts department first. In our school this involved having a section for grades seven to nine individualized, involving 101 number of students in one class period, and grades ten to twelve involving 131 students in one class period. We used the staff of three full time teachers, two part-time teachers, principal, and a lay reader as a teaching team.

Our high school physical plant is fifty years old, consisting of three and a half floors. We had a remodeling program on our bottom floor enabling us to have one large instruction room capable of holding 120 students, three other smaller classrooms and the library all on the bottom floor of our building and closely accessible to each other. We feel that the facilities considering the age of our building lend themselves to an ideal atmosphere of learning in an individualized program.

Preparation -

(a) Description of Teaching Orientation:

In February of 1964 several staff meetings were held involving the district curriculum supervisor, the English teaching staff and the administration. It was decided at this time we would begin analyzing other small schools in our area already involved in individualized instruction. We arranged for our staff members and administrators to visit Parowan High School, Cedar City High School, Panguitch High School, Bryce Valley High School, and Virgin Valley Nevada High School. After the visits we held additional staff meetings to analyze the existing programs of each and how we could establish a program to fit our own needs. The spring of 1964 we conducted an extensive testing program of all students. We checked their records thoroughly and recorded pertinent information for each student. We decided to have our language arts teachers report back to school the last week of July during the summer of 1964, this would give them four weeks to work together as a team and complete the curriculum planning we had worked on during the spring of the year. The staff also attended the Western State Project Workshop, held at Brigham Young University. A series of meetings with parents to discuss the new program with them, and to orient them on the anticipated changes took place during the spring of 1964. By the time our students reported for school August 31, 1964, we had the curriculum pretty well completed, purchased many varied types of language arts materials and were ready to begin an extensive orientation period orientating each of our students into a new program of individualized language arts instruction with team teaching. We had excellent support and encouragement from our Board of Education, District Superintendent of Schools, and our District Curriculum Supervisor. It took almost one year of thorough preparation before we launched ourselves into this new program.

Procedures - Our junior high school Language Arts group meet first period in our large classroom facility and an immediate adjacent classroom. For convenience of roll check, each student has an assigned seat - it takes one minute for complete roll call. Instructions for the day are listed on the chalk boards in the classroom area. From these instructions the students determine individually whether they will be in a discussion group, working individually on regular work or in a testing situation. Each student has been counseled independently, with a counselor, and has arranged a program to meet his individual needs. This program is a part of a schedule kept in a folder with all other materials used by the student. They have to complete grammar, literature, composition, spelling and reading units during the year designed on their individual level. When the students have completed prescribed work and ready for testing or discussion or counseling, they indicate this in writing and place in the teacher preparation box. Students have freedom of movement to pursue the work that may be involved in their daily program. Rather than have students assigned to group levels, we have attempted looking at the student individually and set up a complete program for the student as an individual. Because of our enrollment and the program we have been able to succeed fairly well in the project. All of our spelling tests and many of our discussions have been previously taped by the teachers and the tape recorder replaces the teacher in this activity. Our senior high school meets the second period of the day and follows somewhat the same activity.

We have duplicated unit outlines for all levels of work for the student to follow - each student does his own recording, but the teachers also keep a record for grading and counseling purposes. The teachers and lay reader do all checking. Our team planning period for the teacher is of utmost importance in keeping things organized and taking care of all checking of materials and program organization.

Evaluation - After being in the language arts program for one year, I feel that the following comments to be pertinent in evaluating our last years' program:

(1) We feel that we were able to reach more students with the new program of individualized instruction than we did in the conventional classrooms.

(2) The National Merit Scholarship Examination and the American College Testing Program of last year has indicated to us that we did make some gain with our junior and senior students in efficiency. We will conduct achievement tests this fall on all grade levels which will enable us to determine other class areas.

(3) I am completing counseling with our next year seniors and all of them agree that the program has helped them. Some stated they prefer the conventional classroom because they feel more comfortable in always being directed. By far the majority do not wish to change back to the other program.

(4) We now have Language Arts in two periods rather than nine and this has enabled us to free teachers for other teaching assignments which have broadened our curriculum offering.

(5) We have some school patrons who have reservations concerning the success of the program. The majority are with us and feel that once we have it successfully in operation it will be an asset.

(6) The success of our program is contributed to the fact that we had a team of hard working teachers willing to put in the extra mile and work towards improving the program.

(7) We have found that we need to do a better job of orientation, and a preparation has been made to improve this problem.

(8) We need to do a better job of student orientation on how to study and accept the responsibility for self-discipline.

(9) We had a shortage of some materials but have been able to correct this for the coming year.

(10) We have eliminated most of our dropout problems, because the slow learner has a program designed to help him.

Materials and Resources -

(1) Harcourt Brace and World Publishing Company

   a. English Grammar Composition 7 - 12 Warriner et al.
   b. English 2200, 2600, 3200 series, author Bulmenthel.
   c. Literature Companion Series - six levels.
   d. Laureate Literature Series 7 - 8th grade levels.

(2) Science Resource Associates

   a. Reading labs (all levels)
   b. Spelling labs (all levels)
   c. Contemporary Transparency lab.
   d. Vocabulary lab
   e. Literature lab

(3) California Testing Bureau

   a. C - D and E - F Language Arts Materials.

(4) Scott Foresman

    a. Complete Literature Series 7 - 12.

(5) Ginn and Company, Author Gordon

    a. Introduction to Literature
    b. Study of Literature
    c. A Program Approved to Writing

(6) MacMillan Company

    a. Sullivan - Program English

We use several series of records, tape recordings and television.

PROMISING PRACTICES FOR IMPROVING INSTRUCTION IN SMALL SCHOOLS

Practice No. 8
Individualizing Instruction in High School English

Wayne High School
Bicknell, Utah

A project of
The Western States Small School Project

Utah State Department of Public Instruction
Dr. T. H. Bell, Superintendent
Room 223 - State Capitol Building
Salt Lake City, Utah

INDIVIDUALIZING INSTRUCTION IN HIGH SCHOOL ENGLISH

Wayne County District — Arthur H. Lee, Superintendent

Wayne High School — Sammy N. Newton, Principal

Contributing Teacher(s):

Mark E. Larsen
Myrra W. Newton
David Kjar

* * * * * *

General Description -

(a) Problem to be Solved:

What kind of English program will highly motivate students to develop their communication skills, to learn to understand the way language functions, and to appreciate and enjoy literature.

(b) Desired Outcomes:

1. A program which will encourage each individual student to work at a rate of speed which is most productive for him.
2. A program which will encourage the student to participate in the evaluation of his needs and the selection of his objectives in the course, and which will assist him in attaining these objectives.
3. A program which will require every student to interact as both speaker and listener in discussions of the literature read.

(c) Grades, Pupils and Teachers Involved:

Eleventh and twelfth grade students enrolled in English on a non-graded basis were included. This involved four classes and three teachers. The ungraded basis provided for a more flexible schedule offering five periods where English could be taken.

Preparation - Various English materials (listed below) which were designed to permit students to progress through them at individual rates of speed, were purchased. The teachers prepared study guides; these were in the areas of history of the English language, critical reading and listening, how to write a research paper, literature and others. The literature units consisted of some units on a theme with reading to be done and questions to be answered, other units on unrelated reading materials at various ability levels, also with questions. Books containing the material to be read were "rounded up" from various sources, library, private collections, paperbacks, etc., and centrally located. An individual progress record for each student was prepared.

Practice - At the beginning of the year the students in each class were divided into reading groups of four or five per group and assigned a literature unit with its accompanying study guide. These groups were assigned reading on the basis of the S T E P Reading scores. The students with the highest reading scores were given the units on themes. The next group was given a unit with a novel and short stories which were fairly easy reading, had high adolescent appeal, high literary merit, and with an adventurous, outdoor setting. Most of this group were boys and the purpose of the unit was that they might end the year with a rewarding experience with literature and thereby receive increased motivation toward future undertakings in the class and elsewhere. A third group was selected because their behavior at school had distinguished them as being among those students most alienated from school and society. They were required to read a novel in which the central theme dealt with the struggle of one adolescent who is on the outskirts of society to determine the relationship of his own values to those of society and its institutions when the two are often in conflict. The purpose for this novel was to focus the attention of these individuals on a problem which might lead them to examine their own social relationships. A further purpose was to attempt to reinforce their own self-esteem through identification with the highly admirable central character of the novel.

In addition to being assigned to a literature study group, each class was oriented to the entire range of study materials and readings available to them and each student with the teacher determined what he should be able to accomplish during the year (many students accomplished more than they had anticipated they could). The students had needs for certain areas of study and spent time on those areas.

Each student was required to periodically complete a lesson in the Ginn Unit Lessons in Composition book. These books were purchased and assigned on ability levels.

Many students completed Sullivan's Programmed English as a review of grammar.

Units on History of the English Language, Critical Reading and Listening, How to Write a Research Paper, were based on material in Your Language, Book 6. Punctuation units, spelling units were also available to those who needed them.

Evaluation - No objective evaluation of this program has been attempted. However, both student reaction, as it has been voiced and observed through classroom behavior, and teacher reaction support the conclusion that this program has been sufficiently satisfactory to the participants so that they wish to continue some form of it next year.

Student opinions expressed midway through the year were that they did not prefer to return to a program wherein all students would work on a single assignment. One student said, "I have really enjoyed this class in every way. I especially like the way we worked individually so that each student could work on what he needed most rather than on an assigned subject which he felt he did not need." Many students commented that they had learned more this year than any year since they were in the 7th grade.

Teacher Opinion: This program seemed encouragingly successful, both in allowing each student to work at his own rate of speed and in motivating him to work at his best rate of speed. (We were amazed at the range of variability.) The use of the Individual Progress Record and the allowance of freedom for the student to select his own objectives and study materials were essential contributors to this success.

The program seemed somewhat successful in encouraging the student to participate in the evaluation of his needs and in the selection of his objectives and in assisting him to attain those objectives. However, much improvement remains to be made. Study guides and materials in sufficient variety and level of skill were not available to the student. And equally as serious, students lacked valid means by which to determine their extent of progress through the year.

The discussion sessions held in connection with the literature units were very successful. Since there were usually fewer than seven in a group, everyone participated as both speaker and listener. However, certain factors did operate to reduce the extent of success below what it might have been. For one thing, these sessions were not held often enough. Also, too little provision was made to permit students to have a discussion session as they felt the need for it.

Materials and Resources -

Classroom
Office
School Library

State Bookmobile Library
Public Library

Programmed English - MacMillan
Unit Lessons in Composition - Ginn
A Programmed Approach to Writing - Ginn
TMI - Grollier Self-Tutoring - Spelling
TMI - Grollier Self-Tutoring - Punctuation
Programmed Vocabulary - Lyons & Carnahan

Teacher-made study guides:

Literature anthologies
Short story collections
Paperback novels
Your Language Book 6
Other language references

PROMISING PRACTICES FOR IMPROVING INSTRUCTION IN SMALL SCHOOLS

Practice No. 9

Expanding Mathematics Study Opportunities in Small High Schools

Wayne High School
Bicknell, Utah

A project of
The Western States Small School Project

Utah State Department of Public Instruction
Dr. T. H. Bell, Superintendent
Room 223, State Capitol Building
Salt Lake City, Utah

EXPANDING MATHEMATICS STUDY OPPORTUNITIES IN SMALL HIGH SCHOOLS

Wayne County District	Arthur H. Lee, Superintendent
Wayne High School	Sammy Newton, Principal

Contributing Teacher(s):

Ernest H. Jackson
Mark Larsen

* * * * * *

General Description -

(a) Problems to be Solved:

Wayne High School has the problem, with its limited staff, of offering a broad curricular program which will meet the needs of all its students. This project was initiated to improve these offerings in the area of mathematics.

By national averages, mathematics enrollment in grades nine through twelve in Wayne High School has been low. The only offerings in these grades were elementary algebra, plane geometry, and consumer's mathematics. There was one teacher with training to teach algebra, geometry, and higher courses in mathematics. Approximately one-half his time was used in teaching science and eighth grade mathematics.

It was proposed that program flexibility be increased to avoid schedule conflict, and that the curriculum be extended. This was to be done by organizing multiple classes in mathematics for several periods per day. It seemed to the personnel involved in the project that programmed materials would lend themselves well to a multiple class situation.

(b) Desired Outcomes:

The objectives of the program were, (1) to increase mathematics offerings and to make it possible for more students to enroll in mathematics courses in Wayne High School, (2) to compare the effectiveness of TEMAC programmed texts in a multiple class situation in promoting student progress in mathematical knowledge with the effectiveness of more conventional methods of presenting mathematics, and (3) to discover effective methods for using programmed materials.

(c) School Situation-

Wayne High School is a combined junior - senior high school with grades seven through twelve. It has an average enrollment of about two hundred sixty students and serves a population of about sixteen hundred persons, the entire population of Wayne County, Utah. Most of the students are brought in by bus, some from as far as seventy five miles.

Limitations in size make it difficult to schedule conventional classes so as to avoid conflict; and it is not economically feasible to hold conventional classes for the small groups of students who want to study such courses as intermediate algebra and trigonometry; however the administration and the mathematics instructor consider the needs of these students important.

__Preparation__ - The instructor was oriented in the use of programmed materials at a one day workshop sponsored by Encyclopedia Britannica Films in Salt Lake City in the summer of 1961, and received additional help with programmed materials and the problems of small schools at the following workshops sponsored by the Western States Small Schools Project: Brigham Young University, Provo, spring of 1962 and summer of 1964; Utah State University, Logan, summer of 1963; and at Albuquerque, fall of 1963.

Materials used have been TEMAC programs in the subject matter areas mentioned in the text of this report, and SCAT, STEP and COOP tests.

Administration has made the project possible by arranging time in the schedule to carry out the project, arranging time for testing and counseling of students, arranging for the acceptance of the project by the WSSSP, arranging for consultant help, maintaining liaison with WSSSP, permitting the instructor to attend workshops on school time, sending administrators and faculty members to workshops, and handling the business part of the project.

Practice -

Organization:- The project was organized to take care of the functions of testing, guidance, and instruction.

Under the administration of the school guidance counselor pre and post tests were administered to students in the experimental program, using Cooperative Achievement Tests in the appropriate subject areas; also in March 1963 and each March thereafter SCAT and STEP tests were administered to all students in the high school, excluding the 1964 twelfth grade. Where available scores on other tests were used in the guidance of students.

During the 1961-62 school year thirty-two students met in the chemistry laboratory and studied geometry and second year algebra using TEMAC texts.

In 1962-63 programmed mathematics was offered two periods during the day. One section consisted of twenty students and another of sixteen; both met in a small classroom. In addition two students were permitted to study on their own. The offering during the year was increased so that it included first year algebra, second year algebra, geometry, trigonometry, and modern algebra.

During the 1963-64 school year programmed mathematics was again offered two periods during the day. The sections contained thirty-one students each and met in a large classroom. In addition, seven students met in a group in another room during another period and studied the materials without the supervision of a teacher except when taking tests. Also, one other student studied the materials during a fourth period with a teacher's help available to him.

The course offering was enlarged to include a general mathematics course for those students who could not profit from algebra.

The same subject matter was offered in 1964-65 to one hundred six students. These were divided into four sections meeting in different periods of the day. The size of the sections varied from nineteen to thirty-nine.

Each student was issued a TEMAC programmed mathematics textbook and supplement and allowed to progress at his own rate. When available, teacher help was given at the request of the student. Each student made a weekly report of his progress, and took tests at the places indicated in the teacher's manual. Tests were checked by the instructor and, if deemed advisable, discussed with the student. If the test showed that the student had failed to master the unit of subject matter he was given suggestions for review and later tested on the same material using a different form of the test. When the area was reasonably well mastered, the student was permitted to progress on to the next unit.

There was some attempt to hold small group discussions under teacher supervision. This became more difficult as more subjects were added, and the difficulty was further increased as the year progressed and there was greater spread in student accomplishment. Usually by the end of the year all discussion was on an individualized basis.

In 1962-63 students were given a ten day how-to-study course before being issued their TEMAC materials. There has been no evaluation of this innovation since no careful records were kept the previous year.

Time goals:- The percentage of students who completed their courses in 1963 was disappointing. Some students did well and worked to capacity. Too many took advantage of what they considered their privilege to work as slowly as they wanted.

There was introduced during the 1963-64 school year a policy of student set goals as to the amount of material to be covered and the quality of work necessary to receive a passing grade. This was accomplished as follows: First, a form was devised, part of which constitutes the following page of this report. With this form the student is able to plot each day of the school year against the number of hundreds of frames he has completed in his course. At some time during the first three weeks of school each student met privately with the school counselor. They discussed scores on standardized tests, past achievement of the student, and such other predictive material as the counselor may have had in his office. After the discussion the student in consultation with his counselor set a reasonable goal as to the amount of credit he might be expected to earn. The rate that he must work to attain the goal was indicated as a graph on the form and was filled out in duplicate. One copy remained with the student and the other was given to the instructor. The counselor also indicated to the instructor the quality of work which might be expected from the student. This was determined with the help of a scale developed by the Brigham Young University. As the student progressed he plotted his achievement against the date. The instructor's copy was kept up-to-date from the student's weekly report of progress. A glance at the form was all that was necessary to see whether the student was progressing at a rate which would enable him to reach his goal.

Control groups:- Forty-five ninth grade students were given SCAT and STEP tests in March of 1963 and again in March of 1964. Unfortunately in 1963 they were scored against beginning of the year norms and in 1964 against end of year norms. Under these circumstances the students would be expected to lose a few percentile points.

Of these students, nine were enrolled in IEMAC first year algebra; seventeen were enrolled in a conventional first year algebra class using Nichols and Collins, Name______________________________ Course____________________________

Date started______________________ Date ended________________________

Homework

1______
2______
3______
4______
5______
6______
7______
8______
9______
10______
11______
12______
13______
14______
15______
16______
17______
18______
19______
20______
21______
22______
23______
24______
25______
26______
27______
28______
29______
30______
31______
32______
33______
34______
35______
36______

Test scores

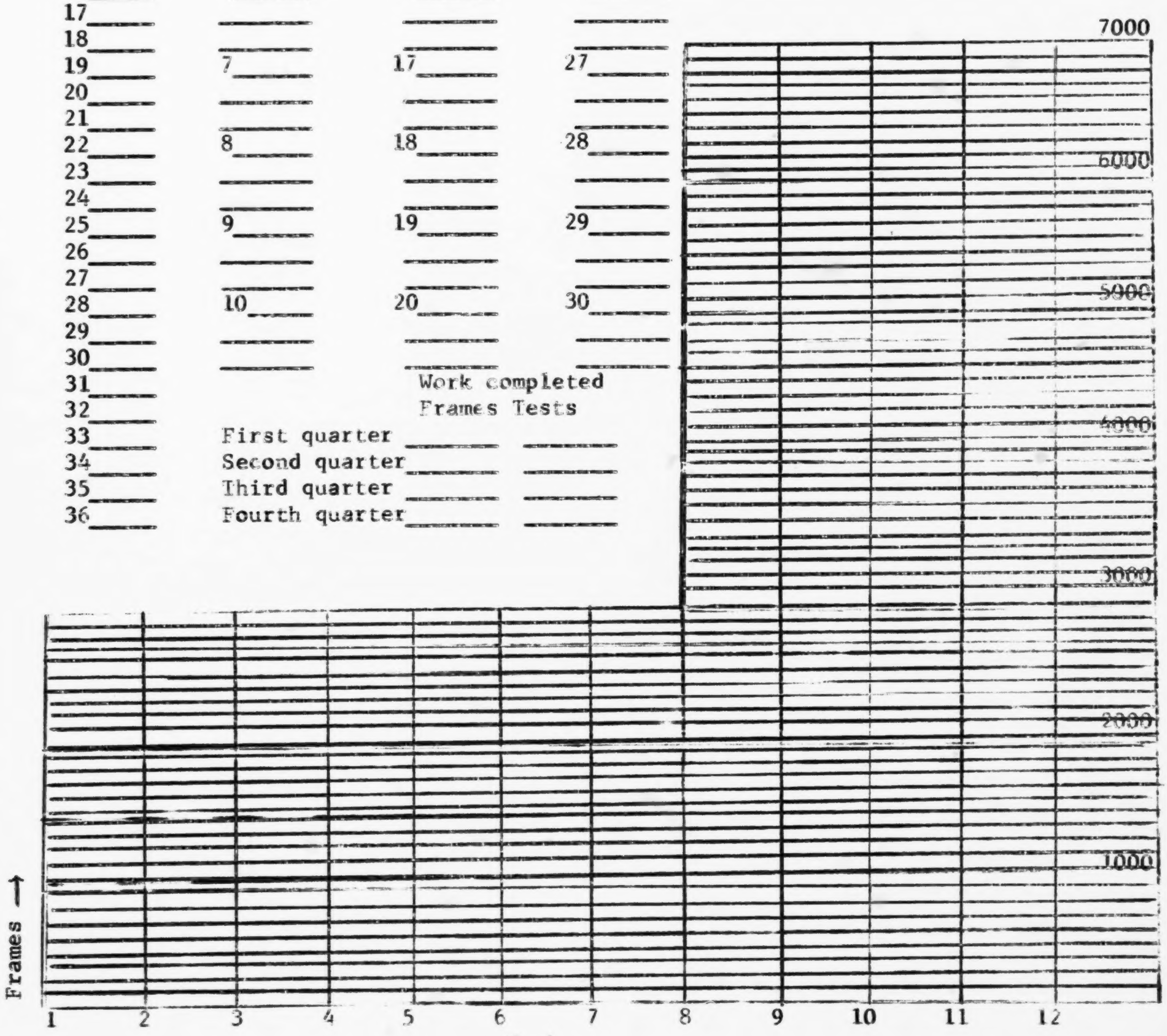
1______
______
______
2______
______
______
3______
______
______
4______
______
______
5______
______
______
6______
______
______
7______
______
______
8______
______
______
9______
______
______
10______
______
______
11______
______
______
12______
______
______
13______
______
______
14______
______
______
15______
______
______
16______
______
______
17______
______
______
18______
______
______
19______
______
______
20______
______
______
21______
______
______
22______
______
______
23______
______
______
24______
______
______
25______
______
______
26______
______
______
27______
______
______
28______
______
______
29______
______
______
30______
______
______

Cumulative test scores

1______
______
______
2______
______
______
3______
______
______
4______
______
______
5______
______
______
6______
______
______
7______
______
______
8______
______
______
9______
______
______
10______
______
______

Expectancy score______

	Work completed Frames	Tests
First quarter	______	______
Second quarter	______	______
Third quarter	______	______
Fourth quarter	______	______



Modern Elementary Algebra as a text. The remainder were not enrolled in any mathematics course during the year. The programmed class and the conventional class were both taught by the same instructor.

For purposes of getting some comparison between the effectiveness of the experimental program and that of a conventional class, three groups from the ninth grade were equated as nearly as possible on mathematical ability using the quantative section of SCAT as a measuring device.

The experimental group consisted of all members of the ninth grade who were enrolled in the TEMAC first year algebra course.

The first control group consisted of nine students picked from the conventional modern algebra class.

The second control group consisted of six students who were not enrolled in a mathematics class.

Growth was measured by the difference between the 1964 and the 1963 STEP scores.

Evaluation - Attempts to determine the results of the project have been made from, (1) enrollment trends, (2) rate of student progress, (3) results on standardized tests as compared to national norms, (4) results of standardized tests given to experimental and control groups, (5) comparison of student progress from one year to the next when a variable is introduced, (6) student opinion, and (7) the instructor's subjective judgment, based upon his observation of the program.

Results of the project, in terms of its objectives, are summarized numerically in the tables which appear in this section.

Enrollment trends: - Mathematics enrollment trends obviously are affected by many variables including, subject matter requirements, interests, home and community backgrounds, vocational and educational plans, abilities, curriculum offerings, etc. Any tentative conclusions which may be drawn from the relationship between new curriculum offerings made possible by this project and mathematics enrollment is based on the assumption that other factors have remained relatively constant during the time of this project and the period immediately preceding it. Trends in mathematics enrollment in Wayne High School during the years of this project and for some time before are summarized in Table 1.

Table 1. Trends in mathematics enrollment, grades nine through twelve, Wayne High School 1958 to 1965

Year	Total enrollment grades 9 - 12	Mathematics enrollment	Percent enrolled in mathematics
1958-59	174	72	41
1959-60	161	86	53
1960-61	170	71	42
1961-62[a]	170	77	45
1962-63	168	88	52
1963-64	175	129	74
1964-65	178	120	67

[a] Introduction of TEMAC programs

Mathematics enrollment in the school has tended to increase since the beginning of the project. Although enrollment in programmed classes increased during the 1964-65 school year, enrollment in conventional classes decreased enough to result in the lower percent of students taking mathematics.

Any enrollment in such courses as second year algebra and trigonometry has been made possible by the project, since such courses were not previously offered.

The writer feels that the general increase in percentage of students studying mathematics is desirable, but decrease in enrollment in conventional classes is undesirable until such time as programmed classes are shown to be more effective.

Results measured by standardized tests:- Mean scores and variability on standardized tests are given in Tables 2, 3, 4, 5 and 6. The scores given are for appropriate subject areas on the Cooperative Achievement Tests, for the mathematics section of the Sequential Tests of Educational Progress, and the quantitative section of the School and College Ability Tests.

Table 2. Mean scores and variability on certain standardized tests at the completion of a course in TEMAC elementary algebra and/or at the end of 36 weeks spent in the course

	COOP					STEP			SCAT		
Year	%tile	Range	S.D.[a]	SS[b]	Range	%tile	Range	S.D.	%tile	Range	S.D.
1963	37	2 -88	31.8	11	3 -20	45	4 -96	34.9	40	5 -84	31.8
1964	57	1 -98	24.6	9	$^{-}3$ -32	59	2 -99	25.5	59	1 -99	30.5
1965	28	0 -95	26.3	10	0 -19	59	12-97	20.5	50	6 -97	24.2

[a] The notation S.D. will stand for standard deviation in this and subsequent tables.

[b] The notation SS will stand for points gained on scaled scores between pre-test and post-test in this and subsequent tables.

Table 3. Mean scores and variability on certain standardized tests at the completion of a course in TEMAC intermediate algebra and/or at the end of 36 weeks spent in the course

	COOP					STEP			SCAT		
Year	%tile	Range	S.D.	SS	Range	%tile	Range	S.D.	%tile	Range	S.D.
1963	25	3 -40	16.7	6	0 -11	70	31-97	16.5	66	46-87	16.7
1964	36	12-70	24.0	11	3 -19	71	35-97	20.5	73	58-98	15.7
1965	31	0 -70	18.6	10	$^{-}3$ -23	70	53-82	8.9	76	31-94	18.8

Table 4. Mean scores and variability on certain standardized tests at the completion of a course in TEMAC plane geometry and/or at the end of 36 weeks spent in the course

	COOP					STEP			SCAT		
Year	%tile	Range	S.D.	SS	Range	%tile	Range	S.D.	%tile	Range	S.D.
1963	32	1 -54	17.1	16	0 -29	63	1 -97	29.1	55	6 -92	30.7
1964	21	0 -62	22.5	10	-16-48	71	35-99	16.8	72	31-99	20.6
1965	40	0 -91	31.4	19	-6 -39	71	2 -98	23.7	71	6 -99	25.2

Table 5. Mean scores and variability on certain standardized tests at the completion of a course in TEMAC trigonometry

	COOP					STEP			SCAT		
Year	%tile	Range	S.D.	SS	Range	%tile	Range	S.D.	%tile	Range	S.D.
1963	64	59-79	17.6	17	15-19	92	79-99	8.2	94	91-99	3.6

Table 6. Mean scores and variability on SCAT and STEP tests at the conclusion of TEMAC basic mathematics course

	SCAT			STEP		
Year	%tile	Range	Standard deviation	%tile	Range	Standard deviation
1964	19	2 -50	15.8	25	2 -50	14.9
1965	28	1 -79	20.5	31	4 -87	24.9

An examination of these tables shows that in general the students in geometry and algebra classes achieved in the low average range in their specific subject areas as measured by COOP tests, but were generally average to high average in general mathematical knowledge as measured by the mathematics section of STEP tests. There was considerable variability in achievement, but it was quite consistent with variability in aptitude as measured by the quantitative section of SCAT. Some students achieved in the high average to high range each year. Abilities of students generally increased from elementary algebra, to geometry, to intermediate algebra.

1963 was the only year in which a group of trigonometry students began studying together. Students taking trigonometry in subsequent years have begun the study at odd times during the year or have been enrolled on a part time basis. As measured by SCAT the 1963 students constituted a high ability, relatively homogeneous group. Variation in achievement was considerably greater than might have been expected considering the rather homogeneous measure of their ability.

The students studying basic mathematics generally were low to low average ability students, students who did not have the capacity to study algebra. They probably did as well as they could be expected to do.

An analysis of the gains shown in the SS column for 1965 indicated that the chances are about 95 out of 100 that these gains are significant for elementary and intermediate algebra, and about 99 out of 100 that the gains in geometry are significant.

Results as measured by control group:- Comparisons of gains made by ninth grade students enrolled in TEMAC elementary algebra during 1964 with gains made by two control groups, one studying algebra in a conventional class and one not enrolled in mathematics can be made from Table 7.

Table 7. Mean gains in %tile points for certain groups of ninth grade students as measured by STEP tests administered in March 1963 and March 1964. 1963 scores were derived from beginning of year norms and 1964 scores from end of year norms

	SCAT		STEP	
	%tile B8 norms	S.D.	Gain in %tile points E9 - B8	S.D.
Experimental group[a]	90.4	9.9	-12.6	12.9
Control group one[b]	89.2	11.7	- 5.7	7.8
Control group two[c]	89.7	12.3	-15.0	13.4

[a] Nine students who constituted all ninth grade students enrolled in TEMAC elementary algebra.

[b] Nine students who were studying modern algebra in a conventional classroom, equated in ability as nearly as possible to the experimental group using SCAT B8 norms.

[c] Six students not enrolled in mathematics, equated in ability as nearly as possible to the experimental group using SCAT B8 norms.

Assuming no difference in ability, an analysis of these results indicate that the chances are about 90 in 100 that the students in the conventional class made greater gains than the students in the TEMAC class, and the chances are about 70 in 100 that the students in the TEMAC class made greater gains than the students who were not enrolled in mathematics. Students in the conventional class had greater variability in ability, but students in the TEMAC class had greater variability in achievement.

Effects of goal setting as measured by rate of student progress:- Students who completed their courses in 1964 and in 1965 were working toward student set goals. The students who completed their courses in 1963 were working toward teacher set goals. To get some measure of the effectiveness of the student set goals in increasing rate of progress, the percent of students progressing at a rate which would enable them to complete 90% or more of their course in the expected time was tabulated. Some of these students were progressing at a rate which would enable them to finish 150% or more of their course. The tabulation is shown in Table 8.

Table 8. Percent of students who progressed at a rate which would enable them to complete 90% or more of a course in the expected completion time

Year	First year algebra	Second year algebra	Geometry	Trigonometry	Basic mathematics
1963	36	50	38	60	--
1964	82	50	39	80	82
1965	29	82	60	67	80

Results of this policy of goal setting are inconclusive, several variables affect this rate of progress. Nine students in the 1965 elementary algebra had already received nearly a unit of credit in general mathematics and were not particularly interested in earning more credit. Only five percent of students in the 1965 class indicated that they were interested in taking more mathematics than they could have taken under our previous program, compared to fifty or more percent in the 1963 and 1964 groups. Other variables such as abilities, interests, future plans, etc. doubtless affected the rate of progress. It is the feeling of the instructor that progress has been accelerated by student set goals.

Student opinion:- The following two pages constitute an opinion survey administered each May while the project was in progress.

STUDENT OPINION SURVEY

Name________________________________

Check only those statements with which you tend to agree.

1. I feel that this course has been effective in increasing my knowledge of mathematics. ( )
2. I have learned some mathematics, but feel that another method of teaching would have been more effective. ( )
3. I like this method of instruction because I can progress at my own rate. ( )
4. Use of this method makes it easier to make up work missed because of absence. ( )
5. Students who fall behind the class average tend to become discouraged and give up. ( )
6. Students who might tend to fall behind in a conventional class will tend not to become discouraged using TEMAC, because they are not forced to compete with faster students. ( )
7. In general this is a good way to teach mathematics, but it would be more effective if periodic class discussions could be arranged. ( )
8. I find this method of studying boring. ( )
9. This might be an effective way of teaching, but I find it difficult to discipline myself to study without a definite assignment ( )
10. I feel that I can get more teacher help with my individual problems using this method than if we were using another method of teaching. ( )
11. I feel that I can get less help with my individual problems using this method. ( )
12. I feel that we could get more out of the class if we were all studying the same subjects. ( )
13. The presence of students in the class who are studying other subjects does not greatly affect my progress. ( )
14. Too much of our time is spent reviewing for and taking tests. ( )
15. I would rather the tests were given at longer intervals. ( )

16. I believe that the spacing of the tests has been about right ( )

17. Discussing test results with the teacher helps me to understand mathematical concepts which were not clear to me. ( )

18. Discussion of test results is too brief to be of much value in helping me to solve my problems ( )

19. This method is helpful to me because otherwise I could not take as many mathematics classes as I need or would like. ( )

20. I feel that it would be better to use another method of instruction even though I could not take as many mathematics classes as I would like. ( )

21. Scheduling several classes the same hour for more than one period, helps me to take more other classes that I want. ( )

22. I like this method, because in a bind, I can use the period for studying another class and make up my math work at another time. ( )

23. There is too much opportunity to visit in our class. ( )

24. Individual study areas would help me to progress faster. ( )

25. Laboratory periods featuring applications of mathematics would be helpful. ( )

26. This is the poorest method I have ever used in studying a subject. ( )

27. The steps between frames are too small; they contain too much detail and too much repetition. ( )

28. This is one of the most effective methods I have ever used in studying. ( )

29. I believe the credit I earn has more meaning because it is given on the basis of what I accomplish and not on how much time I spend in class. ( )

30. I believe that a student who is here every day should be given a full unit of credit whether or not he completes the course. ( )

Give below any comments you have on improving this course, particularly on improving the use of these kinds of materials.

It is the writer's opinion that a tendency to agree with statement 1, 3, 4, 6, 10, 19, 21, 28, and 29 on the student opinion survey correlates positively with a favorable attitude toward the program, while a tendency to agree with statements 2, 5, 8, 9, 11, 12, 20, 26, and 30 correlates negatively with a favorable attitude toward the program. The remainder of the statements and No. 9 have to do with suggestions for modifying the program. A tendency to agree with statements 7, 14, 15, 18, 23, 24, 25, 27, and 9 would favor a change in the program, while a tendency to agree with statements 16, 17, and 19 is favorable to leaving the program as it is.

Although all statements are not equally polarized toward a favorable or an unfavorable attitude, some attempt to measure student acceptance or rejection of the program was made by averaging the percent of students who agreed with favorable statements and comparing this figure with the average percent who agreed with unfavorable statements. The result is tabulated in Table 9.

Table 9. Mean percent of students tending to agree with statements favorable or unfavorable to IEMAC mathematics programs

	1963	1964	1965
Favorable	69	73	68
Unfavorable	36	25	15
Ratio of favorable to unfavorable	1.9	2.9	4.5

As can be noted from the table, the ratio of favorable to unfavorable responses were nearly two to one in 1963 and had increased to more than four to one by 1965.

In no instance did a majority of the students favor changing any aspect of the program; however, substantial minorities would favor better class control, independent study areas, and greater emphasis on goal setting.

Following are some typical comments which students added to the opinion survey.

> I feel this type of teaching has helped me greatly in my studying mathematics. About improving the course, I would say it satisfied the needs as it is.
>
> I think group discussions periodically would really be helpful. A teacher has a way of explaining some principles that cannot be completely understood by reading them out of a book.
>
> I feel that this is a good course, but I cannot discipline myself. I think if we had assignments by the teacher we would do more.
>
> Junk these machines and go back to the teacher. To show what I mean, I got straight A's with a teacher and learned things; now I'm in the C bracket and learning very little.
>
> I don't agree with this type of teaching. True, it helps some, but more are discouraged. I know myself, I would like to take more math classes, but if TEMAC systems were to continue I would not even remotely consider it. There are others who share my point of view. Interest in this class is a thing of the past. There is too much repetition, and the examples are too hard. A dual teaching program one using TEMAC and another using the conventional system would benefit everyone.
>
> In general I feel that the geometry course was very well done and interesting.
>
> I feel it should be more related to the teacher.
>
> Setting periodic deadlines as a booster to study would help students finish the course.
>
> I like the way the material of the course is made up, but I am sure that if individual study areas were provided, much more math would be accomplished.
>
> I would like more time. What I have covered I have learned. Usually in math I go a whole year and don't learn anything, but now I know at least what I have covered, even if I have not finished the book.
>
> Have intervals in which you have class discussions in which to see how much a person has learned.
>
> I feel that if we could have an instructional period every week or two to define terms, pronounce words, etc. it would help the student understand the course a lot better.

I have enjoyed this system of teaching very much and I feel I have gained much in my study of math. More emphasis could be placed on applications of what is learned.

I like the course the way it is. Even if it gets hard to understand at times I can always get the teacher's help.

This course, I believe, could be improved by having very strict class discipline. I would like to see this method of study extended to other areas, not just math. I think some books, such as geometry, are written so as to be easily understood. Others are a lot harder to understand. If they were all written on the same level of understanding it would be easier.

This is one of the most efficient ways of studying any kind of subject that I have ever taken in high school.

Everything that I feel about the course is included in the statement, you gain much more from the subject by using the TEMAC system. I hope this program is carried on into future years. It has helped me greater than any other way of studying.

I think that individual classes would be helpful as far as progression and learning are concerned; such as algebra one in one classroom, algebra two in another, etc.

I feel that the class was very interesting and satisfactory. I feel a great sense of accomplishment since I completed my course in plenty of time. The method of letting a student study at his own rate is far better than other methods because slower students need more time for reviewing. It also helps for building character since the student depends upon himself.

I feel that this is an improved way of teaching; because if it weren't it wouldn't be useful to me. It might be improved a little, but I don't know how.

Evaluation-

Instructor's interpretation of results:- The instructor feels that although this project has helped in some aspects of the mathematics program, more work needs to be done toward solving problems of instruction. In summary:

1. This program seems to hold promise for increasing the flexibility of, and enlarging the curriculum offerings in Wayne High School.

2. The program seems to have made it possible for a larger percent of students to enroll in mathematics classes.

3. The program is in harmony with the philosophy of individualized instruction. Variability in achievement is quite consistent with variability in ability. The ninth grade experimental group in elementary algebra in 1964 and the trigonometry group in 1963 showed considerably greater variation in achievement than in ability.

4. An accurate evaluation of the program from standardized tests is impossible because there was not sufficient control groups. Achievement on subject matter tests was not as high as abilities seemed to warrant, and in several instances varied considerably from the instructor's subjective judgment of the student. Over-all mathematics growth as measured by STEP correlates well with ability as measured by SCAT.

5. One of the purposes of the project was to provide opportunity for highly motivated students to achieve in mathematics. A considerable number of such students achieved well as indicated by the wide variability on test scores. Time will tell how well the program will help them to obtain desired goals. One student who completed the TEMAC second year algebra course, the trigonometry course and the language of algebra course was selected for the United States Military Academy at West Point. He credited much of his success in competition for this post to the training he received through this program.

6. It was the instructor's feeling that students in his conventional classes were making somewhat greater progress than the students in the programmed classes. The one measurement using control groups seemed to confirm this.

7. The project has proved helpful in placing students in areas where they might enjoy some success. A considerable number of students in basic mathematics were transferred there from a failing situation in algebra, and most of them enjoyed some success. Some students who were having difficulty

in second year algebra were more successful when transferred to a geometry course.

8. The project made it easier to place students received by transfer and students returning after extended absence.

9. There is need for further investigation into more effective ways to use programmed materials in this situation. The instructor feels that the policy of student set goals has been moderately successful.

10. Discipline problems have increased under this project. Considerable work needs to be done in this area.

11. One criticism of the use of programmed materials has been that students tend to become bored. This did not seem to be an important factor in this project.

12. Generalizations from this study to similar situations should be minimized. Any conclusion which may be drawn concern only conventional classes as they were taught in Wayne High School and TEMAC materials as they were used there. The instructor's training and most of his experience has been in conventional class situations. An area worthy of investigation would be the effect on student progress of special teacher training in the use of programmed materials. In fact it is the instructor's opinion that the special problems of rural schools require teachers with special qualifications and training. Adequate cognizance of this has never been taken in American education, and until the time that rural teaching is made a profession attractive enough to draw and hold the personnel who in the majority of cases possess these qualifications, rural schools will not be able to fully capitalize on their special strengths and achieve the quality of education of which they are potentially capable.

13. There has been no attempt to compare the effectiveness of TEMAC programmed courses versus other programmed courses in mathematics. Some TEMAC

courses seemed more effective than others. Students in second year algebra seemed to have more difficulty than students in geometry or in first year algebra.

It would seem logical that with the passage of time programs will be improved so as to do a more effective job. To quote M. Daniel Smith[a]:

"Some day it may be possible to teach careful observation, perseverance, retention of complex axiomatic systems, and other behaviors which the 'good student' now seems to possess by chance or heredity. This is the greater challenge offered by the field of programmed instruction, and will be its greater contribution to education."

Recommendations and Projections for Further Study -

The following are the instructor's personal feelings and recommendations after three years in the project.

1. Whenever class enrollment is large enough, students should be taught in conventional single classes. Multiple classes should be continued for purposes of schedule flexibility and curriculum enlargement.

2. Careful attention should be given to providing an environment conducive to good study habits. This includes a comfortable room, provision for individual study areas, and work on class control.

3. There should be constant appraisal of, and further experiment with, new courses and innovations which promise to be more effective in achievement of the goals of this project.

4. There should be continued work toward the improvement of the existing program. An area worthy of study would be the effectiveness of taped discussions and reviews to be used with some type of visual aids on an individualized basis.

---

[a] Smith, M. Daniel, "Some Considerations in Teaching Mathematics by Programmed Instruction." The Mathematics Teacher, 55:343-350, May 1962